Railway Age Gazette

Including the Railroad Gazette and the Railway Age

Published Every Friday and Daily Eight Times in June, by the
SIMMONS-BOARDMAN PUBLISHING COMPANY,
83 Fulton Street, New York.

CHICAGO: 417 South Dearborn St. CLEVELAND: New England Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico	$5.00
Canada	6.00
Foreign Countries (excepting daily editions)	8.00
Single Copies	15 cents each

Engineering and Maintenance of Way Edition and the four Maintenance of Way Convention Daily issues, North America, $1.00; foreign, $2.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

Volume 52. April 26, 1912. Number 17.

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GENERAL NEWS SECTION 967

PROMOTERS of full crew laws never sleep; and they are haunting the legislatures this year the same as last. Massachusetts is being carefully attended to, although that conservative old state already has radical legislation in plenty, to burden the railways. But in Massachusetts, as in the state of New Jersey, there are voices that speak out for rational legislation and fair play. For example the *Springfield Republican* in a recent issue says:

> It would seem as if the determination of the number of men to be employed on freight trains could be much more intelligently passed upon by the railway commission than by the Legislature. The average legislator may well hesitate to render off-hand judgment and to lay down hard and fast rules with penalties attached. The Legislature should pay respect to the commission's judgment. In 1908 the commission was asked to investigate "the proper manning of freight trains," and after hearings decided—Walter Perley Hall, George W. Bishop and Clinton White sitting—that there was no necessity for further legislation, and that "a feasible means of securing the safety of the public and employees is to be found, in our opinion, in a strict and rigid enforcement of the existing operating rules of the companies." Is there any reason for believing that the commission has changed its mind in this matter?

And if the Massachusetts legislature cannot trust its commission it might make inquiry in some of those states where full-crew laws are in force. In one of those states a railway commission saw an extra man riding in the cab of a locomotive, and, deeming such a spectacle derogatory to the peace and dignity of the commonwealth—or otherwise improper—sat down and wrote to the railway company, asking an explanation. The general manager replied that the extra man was put there because it was a comfortable place in which to ride; "we have nothing for him to do, and so we thought we would put him where he would be safest from falling off and the least in the way!"

FULL-CREW laws have been put on the statute books of several states under circumstances indicating that the job was done very quietly, final action being taken before the public had much idea of what was going on. This situation will not obtain in Massachusetts, for the railway managers have presented their case to the public in the advertising pages of the newspapers. Their advertisement is not nearly so large as that of the Roosevelt campaigners, but it is very effective. We copy it, minus the big type, in another column of this paper. When political parties (or factions) find "reading notices" insufficient and resort to display type; and when the "Men and Religion" movement takes the same course, the railways may well ask themselves if, in sticking to old methods, they are not behind the times. Massachusetts may also enlighten itself, if enlightenment is needed, by noting what has been done by its next door neighbor, New York, where the governor, John A. Dix, has vetoed the full-crew bill which was passed by the legislature. Governor Dix gives as his main ground for disapproval that the proposed law constitutes an arbitrary rule which it is proposed to make universal in its application without regard to the demands of justice in particular cases. The Public Service Commission has power to require adequate, safe and proper service on the railways, and this includes the power to reduce or increase or change the personnel of a train crew. The proposed law would deprive the commission of this power (to reduce the number of men in a crew). The full-crew law of Pennsylvania has been sustained by a county court (not the Supreme Court), as was almost inevitable under the decision of the Supreme Court of the United States in the Arkansas case; but the last word has not been said, and the fight will no doubt be kept up. It is not likely that the Supreme Court can be induced to alter what it has said in the Arkansas case unless it can be shown that the law amounts to a taking of property without due process of law; but that is just what may be and perhaps can be done in this case. In other words, the full-crew laws are not only wrong in principle, but are outrageously wrong, in principle and in effect. With the Public Utilities Commission of New Jersey and the governor of New York on record as holding rational views on this beclouded subject there is ground for hope. A legislature may do beneficent things in spite of some incidental injustice thereby perpetrated; but when an act is 99 to 100 per cent. injustice it amounts (in a case like this) to actual confiscation, which the Supreme Court when the facts are fully presented, may be expected to forbid.

IN this country railway development has already assumed an intensive rather than an extensive form. The day of bold pioneer construction on a large scale ahead of the development of traffic seems definitely to have passed. Across the international boundary line to the north, however, the history of pioneer railway development may be seen in the making. Elsewhere in this issue is reprinted from the *Yale Review* an ar-

ticle by Avard Longley Bishop, on the plans of the Canadian government for creating a new outlet for the wheat and other products of the prairie provinces by constructing a railway to the shores of Hudson bay. This is one of the most interesting of the various projects for solving the Canadian transportation problem, and in boldness of conception rivals the plans made years ago for the construction of the Pacifics of the United States, and later for that of the Canadian Pacific. To a certain extent the Canadian project has an advantage which our Pacific roads and the Canadian Pacific did not possess in that a vast traffic now seeking an outlet is assured it in advance. On the other hand, the road must pass, as did our early transcontinentals, and also the Canadian Pacific, for the greater part of its length through a territory absolutely without inhabitants and with no immediate prospects of developing any local traffic. However, the Canadians are spared much of the preliminary controversy, such as that which led to the proposal that the Batrachian camel be utilized for transcontinental transportation in this country. They are confronted with few engineering obstacles, and that they are proceeding in a cautious and scientific way to ascertain as definitely as possible the conditions under which the road must be built and operated is indicated by Mr. Bishop's article. There seems room for serious doubt as to the success of a road built for four or five hundred miles through a waste and comparatively unknown region to reach a port that can hardly be open to navigation for over three months in a year. Mr. Bishop shows, however, that the difficulties have been clearly appreciated by the advocates of the road, and that it is notwithstanding this appreciation of them that the government has already appropriated nearly $1,700,000 for the project. As he says, it must be admitted that many now prosperous railways have been projected and built in the face of as serious doubts, and apparently the project is destined to be carried to completion.

LOCOMOTIVE DEVELOPMENT AND THE ENGINEMEN.

NOT very long ago American locomotive design was quite severely criticized in comparison with European designs, because of its crudeness and the lack of highly developed fuel and water saving devices. That this criticism cannot now be so generally applied was indicated by an outline of recent locomotive development in this country, which was presented before a meeting of the Franklin Institute at Philadelphia on April 17 by George R. Henderson, consulting engineer of the Baldwin Locomotive Works. Because of the rapid growth of traffic and the urgent necessity of operating at the highest point of efficiency to offset the higher cost of operation, due to increased labor and material costs, it has proved advisable to increase greatly the capacity of the locomotive.

It was thought that the limit had been practically reached a decade ago, and it was, in a great many cases, as far as the height and width of the locomotive were concerned. One direction was left, however, in which it could expand; this was in the length. While the weight of the locomotive has since increased very considerably, the weight per unit of length has not increased in a like proportion, and it has not been necessary to make as great changes in the roadbed and bridges as would otherwise have been necessary. It is hardly advisable to increase the length of the boiler flues beyond a certain point, and the longer boiler space obtained has, therefore, been utilized by larger fireboxes, the addition of combustion chambers, superheaters, reheaters, feed water heaters, etc. All of these devices have tended to increase the useful work done by each pound of coal.

The average foreman cannot handle more than 5,000 lbs. of coal per hour to the best advantage. Firemen have been known to shovel between 6,000 and 7,000 lbs. per hour, but they worked under such pressure that they could not be expected to secure the most efficient results. Realizing the necessity of securing the greatest possible boiler capacity and at the same time keeping within limitations of the average fireman, the locomotive designers have introduced a number of important features during recent years, which have gradually increased the capacity of the locomotive without making additional demands upon the engineman or the fireman. Some of these developments, which are being used more or less extensively, are the sectional brick arch, combustion chamber, superheater, automatic fire door opener, power bell ringer, coal passers and power reverse gear. On most of the very large locomotives, where the demands are beyond what could reasonably be expected of the firemen, automatic stokers are being introduced, as well as power devices for shaking the grates.

While the tendency was to increase the work of the engine crew while the heavier power was being developed and introduced, the more recent tendency has been to reduce or keep the physical exertion well within the limit, so that both the engineman and fireman can give proper attention to the efficient operation of the locomotive.

DEFECTIVE BOX CARS.

POSSIBLY the most important reason why steel frame box cars have not proved as successful as they should, from the standpoint of loss and damage to freight, has been that in changing from a wood to a steel frame for the superstructure the wooden parts were in most cases replaced by steel ones and no very decided attempt seems to have been made to follow along new lines specially adapted to steel construction. Naturally the results were not entirely satisfactory, as is shown in another part of this issue. Better results would undoubtedly have been obtained if the designers had laid aside all of the details which had been worked out in connection with wooden designs and had started in anew, utilizing only the more general conclusions as to strength, etc., which had been brought out during the development of the larger capacity wooden box cars.

In one notable instance where a steel frame box car had been developed along new and original lines, most of the defects which are responsible for loss and damage to the freight seem to have been overcome. This car will be more fully considered in a later article in the series which is now appearing in this paper.

It is important to note that in the preparation of the third article on defective box cars, all of the photographs, with the exception of those where the side or floor of the car were removed to show the condition of the framing members, were taken on the loading track at the freight house and not in the car repair yard, where the worst conditions are to be found. In no case were the cars marked "bad order"; they were all considered to be in a condition suitable for carrying such freight as it might be necessary to load in them. Is it to be wondered at, therefore, that the railways at large are forced to pay out such large sums annually to settle damages for freight which is intrusted to their care for transportation?

The necessity for using a higher capacity draft gear on modern freight cars has been strongly urged during recent years, and there has been a very considerable improvement in this respect. In many cases, however, the trouble has been not so much with the draft gear as with the method of its application. On steel underframe cars where the gear has been rigidly and securely attached the difficulties seem to have almost entirely disappeared. On one important road having a large number of steel underframe box cars on which all of the draft gear attachments, including the tie plate, have been riveted in place rather than bolted, as is the general practice, no trouble at all is being experienced with the draft gear. The statement was made by one of the officers of this road that when the first large order of cars was equipped in this way a radical change was made in the existing type of draft gear, and that although the cars have been in service for a considerable time there is a question as to whether any of the car repairmen or the foremen know that the cars are not equipped according to the previous standard practice. The change which was made did not increase the capacity of the gear,

but consisted in a rearrangement of the springs which were used in it. Where the draft gear or the draft sills are not securely held to the underframe the end of the car is more or less severely punished by the working back and forth of the gear as it becomes loose. Unfortunately this condition is found to exist on a large proportion of the wooden underframe cars now in service and many steel underframe cars are not in much better condition.

THREE DECADES OF RAILWAY RECEIVERSHIPS.

THE statistical record of railway receiverships goes back for 36 years to 1876. It excludes, therefore, more than two years of the long and disastrous panic and "drag" period that began in the autumn of 1873 and continued for about five years, the actual recovery dating at about the close of 1878, perhaps a little later. As evidence of that panic epoch and its effects in receiverships we have only two years, 1876 and 1877, which together return 80 roads forced into the hands of receivers, with 10,279 miles and $687,294,000 in stocks and bonds. In obtaining any comparison by decades down to and including the last year (1911) we must begin with the year 1882 with results shown in the following tabulation:

FIRST DECADE—1882-91.

Year.	No. of roads.	Miles.	Bonds and stocks.
1882	12	912	$39,074,000
1883	11	1,990	108,470,000
1884	37	11,038	714,755,000
1885	44	8,836	385,460,000
1886	13	1,799	70,346,000
1887	9	1,046	90,318,000
1888	22	3,270	186,814,000
1889	22	3,803	99,664,000
1890	26	2,963	105,007,000
1891	26	2,159	84,479,000
Total	222	37,816	$1,884,387,000

SECOND DECADE—1892-01.

Year.	No. of roads.	Miles.	Bonds and stocks.
1892	36	10,508	$357,692,000
1893	74	29,340	1,781,046,000
1894	38	7,025	395,791,000
1895	31	4,089	369,075,000
1896	34	5,441	275,597,000
1897	18	1,537	92,909,000
1898	18	2,069	138,701,000
1899	10	1,019	52,285,000
1900	16	1,165	78,234,000
1901	4	73	1,627,000
Total	279	62,266	$3,542,957,000

LAST DECADE—1902-11.

Year.	No. of roads.	Miles.	Bonds and stocks.
1902	5	278	$5,835,000
1903	9	229	18,823,000
1904	8	744	36,069,000
1905	10	3,593	176,321,000
1906	6	204	58,042,000
1907	7	317	13,385,000
1908	24	8,009	596,359,000
1909	5	859	78,095,000
1910	7	735	51,427,500
1911	5	2,606	210,606,882
Total	86	17,574	$1,244,963,382

In the last year (1911), of the final decade, the Wabash receivership, which involved 2,515 miles and $207,958,482 in bonds and stocks did not come until last December, and is understood to have been a friendly receivership. If that receivership is omitted the total of the last three years reduces to the comparatively insignificant figures of 16 roads with but 1,685 miles and $132,169,900 of stocks and bonds. It would lower the total for the last decade to 15,059 miles and $1,037,004,900 in bonds and stocks. But taking the tables as they are, and including the Wabash, the returns of the decade become very striking in the comparison. In number of roads the last decade (86 roads) compares with the 222 roads of the first decade and the 279 roads of the second decade. The 17,574 miles of the last decade compares with the 37,816 miles of the first and the 62,266 miles of the second; and the $1,244,963,382 of bonds and stocks of the last decade with the $1,884,387,000 of the first and the $3,542,957,000 of the second. The general correspondence of receiverships with panic periods, notably the high crests of the curve in 1893 and 1908 will be noted, the former year far exceeding any two years of the 30 and slightly exceeding any three. But such transitional high spurts in receiverships do not affect much the general meaning of the contrast of the last decade with the other two which, broadly interpreted, indicates a decided subsidence of receiverships. It must also be remembered that the recession both absolute and relative, has come during a 30 years' increase of railway property and investments. In 1882 there were 114,428 miles of road and $6,960,049,000 bonds and stocks returned for the capitalization of all the railways of the country; in 1892 there were returned 171,805 miles and $10,553,624,000 in bonds and stocks; and in 1910, the latest year returning fairly accurate figures, 239,391 miles and $18,890,850,000 in stocks and bonds. If the decline in receiverships is set against the great increase of railway property and investments, it becomes the more suggestive.

The record of the foreclosure sales, which may be considered as receiverships at their acute and climacteric stage, divided into decades is subjoined:

FIRST DECADE—1882-91.

Year.	No. of roads.	Miles.	Bonds and stocks.
1882	16	867	$65,426,000
1883	18	1,354	47,100,000
1884	15	716	23,504,000
1885	22	3,156	278,394,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
1890	29	3,825	182,495,000
1891	21	3,223	169,069,000
Total	241	30,832	$1,670,648,000

SECOND DECADE—1892-01.

Year.	No. of roads.	Miles.	Bonds and stocks.
1892	28	1,922	$95,898,000
1893	25	1,613	79,924,000
1894	42	5,643	318,999,000
1895	52	12,831	761,791,000
1896	58	13,730	1,150,377,000
1897	42	6,675	517,680,000
1898	47	6,054	252,910,000
1899	32	4,294	267,534,000
1900	24	3,477	190,374,000
1901	17	1,139	85,808,000
Total	367	57,378	$3,721,295,000

LAST DECADE—1902-11.

Year.	No. of roads.	Miles.	Bonds and stocks.
1902	20	693	$39,788,000
1903	13	555	15,885,000
1904	13	524	28,266,000
1905	6	679	20,307,000
1906	8	262	10,400,000
1907	6	114	13,777,000
1908	3	138	2,547,000
1909	12	2,629	250,033,000
1910	17	1,100	93,660,109
1911	13	1,386	40,741,453
Total	111	8,080	$515,404,562

It will be noticed that while foreclosure sales for the first two decades tally pretty closely in the totals with the receiverships, the sales for the final decades show a great disparity in both miles and values—8,080 miles in sales contrasting with 17,574 in receiverships and $515,404,562 in bonds and stocks with $1,244,963,382. It indicates not merely the progressive diminution of receiverships, but also of their seriousness.

In the table annexed the two larger tables are summarized for comparison, the initial letter being used for receiverships and foreclosures:

	First decade.	Second decade.	Last decade.
(R) No. of roads	222	279	86
(F) No. of roads	241	367	111
(R) Miles	37,816	62,266	17,574
(F) Miles	30,832	57,378	8,080
(R) Bonds and stocks	$1,884,387,000	$3,542,957,000	$1,244,963,382
(F) Bonds and stocks	$1,670,648,000	3,721,295,000	515,404,562

The causes of the benign decrease are not hard to find. In the first place weak lines—that is to say *as* weak lines—have been weeded out by time and the fiscal fates. They survive, but under changed conditions and, most of them on a lower financial level. This has been a natural process. But two other continuous forces have been even stronger. One has been the incorporation and merger of the infirm properties into the more powerful railway systems which have been able to sustain them. The other influence has been the supporting power of large railway interests vested in single persons or small groups of per-

sons owning or controlling abundant capital. The salvage of the Erie not so very long ago is a case in point. There is criticism in these days of the undue profits of the big banker in railway directorates, and much of the criticism is undoubtedly just. But the railway foreclosure and receivership records of the last ten years at least hint strongly that in times of corporate stress he has had his high preservative values.

Taking the receiverships of the 36 years, they expand to massive and dramatic figures. The total of $7,632,560,382 in bonds and stocks represents about 38 per cent. of the existing railway securities of the country taken at par. It would be a much larger proportion if computed at earlier periods; and it does not include the receiverships previous to 1876 with the three panic years immediately preceding. Even allowing for "friendly" and "protective," as well as repeated receiverships of the same properties, it is probably safe to say that one-half the railway properties of the country have passed through some form of readjustment; and if the actual losses in securities snuffed out by reorganization could be revealed, they would tell a large tale of fiscal calamity. The other side of the story is the last ten years' record of reduced railway insolvencies and its general attest of increasing railway stability—not the less cheering, because under the strain of hard operating conditions, too familiar to need citation, the receiverships during the last three years have been so few.

NEW BOOKS.

Proceedings of the Nineteenth Annual Convention of the Traveling Engineers' Association, held at Chicago, August 29, 1911. 495 pages, 6 in. x 8½ in. Edited by W. O. Thompson, secretary, Buffalo, N. Y.

This volume contains a list of the subjects discussed at each annual convention, commencing with the first which was held in Chicago in 1893. The principal papers and discussions reported relate to instruction in air brake operation; instruction on fuel economy; lubrication of superheat locomotives; the benefits derived from chemically treated water; the efficient handling of electric locomotives; the Jacobs-Shupert firebox; Mallet compound engines in road service; and the latest developments in automatic stokers. The last includes full descriptions and results obtained from the Crawford, the Hanna and the Street stokers. The discussions of all these papers are fully reported. Some improvements could be made in the manner of printing these proceedings, especially in the index, which is largely personal and not fully subjective. As the work of the association is similar to that of the American Railway Master Mechanics' Association, something could be learned from the manner in which the proceedings of the latter are indexed. The list of members also could be improved by making it similar to that of the Master Mechanics' association, which occupies only one line for each member, while the list of members of the Traveling Engineers' Association occupies the equivalent of three lines for each member, and takes up considerable space.

Judson on Interstate Commerce. By Frederick N. Judson of the St. Louis Bar. T. H. Flood & Co., Chicago. Buckram. 6 in. x 9 in. 805 pages. Price, $6.50.

This is the second edition of Mr. Judson's standard work, the first edition having been published in May, 1905, and a supplement thereto in August, 1906. There has been much legislation and many decisions by the courts and the Interstate Commerce Commission affecting interstate commerce since the first edition was published, and these developments are reflected in the large increase in the size of the second edition over the first edition. Mr. Judson's reputation as a lawyer and as a text book writer is too great to require comment here. Of the value of the volume under review both to lawyers and to students of the general subject of traffic and transportation there can be no question. It is lucid, comprehensive and authoritative. It deals not only with the Interstate Commerce Act, but also with the Anti-Trust Act of 1890, the Expedition Act, the law under which the Department of Commerce and Labor was created, the Safety Appliances Act of 1893 as amended in 1896, 1903 and 1910, the Employers' Liability Act, the Hours of Service Act of 1907, and the 28-hour law. In the appendix are given the Commerce Court Act, the National Trade Union Incorporation Act, the Erdman Arbitration law, the Ashpan Act, the Report of Accidents Act, the rules of practice and forms of procedure before the Interstate Commerce Commission, the rules of practice of the Commerce Court, and the report of the Railroad Securities Commission. Mr. Judson, it will be recalled, was a member of the securities commission.

Early Motive Power of the Baltimore & Ohio. By J. Snowden Bell. Illustrated. Cloth, 156 pages, 6 in. x 9 in. Published by the Angus Sinclair Company, 114 Liberty street, New York. Price, $2.00.

The history of the early locomotives used by the Baltimore & Ohio from 1830 to 1850 is particularly interesting, as it relates to an important chapter in the development of the locomotive in the United States from the very beginning. This work proceeded on original lines, entirely different from those which were followed in England and on other railways in this country at about the same time. The Baltimore & Ohio was the first railway of any considerable length constructed for freight and passenger traffic in the United States, and the first locomotive built in this country, that of Peter Cooper, was successfully operated on it at the early date of August 28, 1830.

The first specification for the construction of locomotives made in the United States was issued from the office of the Baltimore & Ohio on January 4, 1831; it required the engine not to exceed 3½ tons in weight, and to be capable of hauling 15 tons, cars and lading, at a speed of 15 miles per hour on the level. This requirement was met by a locomotive, the York, with vertical boiler and cylinders somewhat similar in general lines to Peter Cooper's engine. It was designed by Phineas Davis, and built by Davis & Gartner at York, Pa., in July, 1831. This was followed by four other heavier engines built by this firm. The second engine of the lot, the Atlantic, was the first "grasshopper" engine used in this country, and was placed on the road September 1, 1832. This engine had vertical cylinders, with piston rods connected to levers located above the boiler and long connecting rods reaching to the gear wheels on the frame. These engines were further developed by Ross Winans, who in 1836 used horizontal cylinders and vertical boilers, and the engines were then called "coal crabs."

Mr. Winans' peculiar traits made him a conspicuous character, and he exhibited unusual inventive genius in his various improvements on the early locomotive, especially in adapting it to freight service and for duty on heavy grades. His work dominated locomotive practice on the Baltimore & Ohio from 1836 to 1856, when he had a controversy with Henry Tyson, then master mechanic, as to the relative merits of the Winans' 8-wheel connected camel engine and Tyson's 10-wheel engines; thereafter no more camel engines were built for the road. The account of Mr. Winans' designs and of the controversy are considered at length.

The book also contains brief accounts of the work of Samuel J. Hayes, who was appointed master mechanic in 1851; Henry Tyson in 1856; Thatcher Perkins, 1859; William H. Harrison, 1885; and A. J. Cromwell, 1887. The author was employed by the Baltimore & Ohio as draftsman during the administrations of Thatcher Perkins and William H. Harrison, and a number of the shaded drawings of the old locomotives which illustrate the volume were made by him. Mr. Bell is well known by railway men on account of the various papers he has written on the advantage of the wide firebox for locomotives and his discussions of various forms of smokebox draft appliances. His early association with the locomotive department of the Baltimore & Ohio and his subsequent study of locomotive boiler design have well fitted him for the preparation of this interesting story of the beginnings of locomotive construction on that road. The volume is illustrated with many rare drawings of old locomotives, and is particularly valuable in furnishing the dates when various locomotive types and details were first used.

Letters to the Editor.

DEFECTIVE BOX CARS AND DAMAGED FREIGHT.

Pittsburgh, Pa., April 14, 1912.

To the Editor of the Railway Age Gazette:

I have just read the first article on the improvement of box car construction with a view of preventing loss and damage to freight. As chairman of our general safety committee, this matter has been brought quite prominently to my attention and the article referred to in your issue of April 12 was certainly written by some one who is thoroughly familiar with the situation.

Our company pays out a large amount annually for loss and damage to freight, and I am free to say that 95 per cent. of the damage might be avoided by better loading of the freight in the car, more careful handling of the cars by the trainmen, and better constructed cars which will not leak at the doors and the roof. Defective cars undoubtedly contribute considerably to this loss, and this is due largely to the fact that railways in purchasing cars, in their endeavors to get them down to the lowest cost, are not willing to pay a price that will warrant good construction of the cars. It is good business to buy at the lowest price, but it is not good business to buy a poor article at any price.

Of course there is no protection against train robbers, except to make it as difficult as possible for them to get inside of the car. There is no reason why car roofs should not be so applied as to be absolutely tight; neither is there any reason why the load should not be placed in the car so as to stand ordinary handling, and trainmen could improve their work and avoid many losses by exercising good horse sense in the performance of their duties.

The series of articles which you propose publishing should do a vast amount of good, for the field is certainly a large one.

L. H. TURNER,
Superintendent Motive Power, Pittsburgh & Lake Erie.

Eastern States, April 17, 1912.

To the Editor of the Railway Age Gazette:

I have read the article on defective box cars and damaged freight in your April 12 issue. We have lately given the question of door fastenings pretty serious attention, and have adopted a malleable door stop and fastening which we think is foolproof and burglar proof. At the same time I am free to say that proper attention has not been paid in the past to the door shoes at the bottom of the doors, commonly called "door guides," simply from the fact that some burglar proof door shoes cost a few cents more than others in the first cost of building a car. This is the reason some railway officers have thought them unnecessary, yet they are willing to pay out thousands of dollars for "lost freight" caused by poor construction.

MASTER CAR BUILDER.

The East, April 23, 1912.

To the Editor of the Railway Age Gazette:

I have read your articles on defective box cars, and think you have hit the nail on the head.

Our principal trouble with box cars leaking grain is due to the tie rods passing from the top plate down through the side sills, the holes having been bored larger than the rod. For instance, where a 5/8-in. rod is used we often find the contract shops bore a 7/8-in. hole. Then the "V" or grain strips are not properly fitted over them and the result is a leaky floor.

I also believe that on all new box cars with good superstructure metal carlines should be used in order to hold the car together.

We are now looking into the advisability of putting in steel ends in all our box cars. I have always contended that the inside lining in box cars—say for a distance of 36 in. or 40 in. above the floor—should be just as solid and as strong as a coal car, for the reason that about the same commodities are hauled in box cars today as are hauled in coal cars, such as pipe, loose wheels, axles, steel rolls, etc. We have reinforced the ends of our box cars with the heaviest wood construction advisable, yet the ends are knocked out just the same, and it is for this reason we favor a steel end; at least, think it advisable to try it out.

There is not a railway in the United States or Canada that has in use a side door which answers the purpose. They are entirely too weak; they should be just as strong as any other part of the car, for when the load shifts or becomes disarranged it will always push out the weak part of the car, which is the side doors, and it is for this reason that we have so many trains side-wiped and so many lost side doors.

DIVISION MASTER CAR BUILDER.

DISHONEST APPLICANTS FOR EMPLOYMENT.

New York, April 15, 1912.

To the Editor of the Railway Age Gazette:

Referring to the article in your issue of April 12, page 834, regarding the supervision and conduct of the employment department: This company has a bureau which supervises the employment of men throughout the system; but I should think the proposition of maintaining a photographic record of applicants would be difficult and expensive to carry out, owing to the large number of applicants; and, on any large railway, the widely different points at which they are hired.

Regarding the question of offering fictitious names, the proportion mentioned, one-third to one-half, must be an exaggeration. Certainly it is much in excess of the actual ratio in our experience. Such cases are encountered, but the percentage is small, and it is the experience on this road that in the majority of instances, the men who falsify their names are "rovers." They do not intend to remain in any one place long enough to be investigated, and so, of course, they escape detection.

J. C. STUART,
Vice-President, Erie Railroad.

New York, April 16, 1912.

To the Editor of the Railway Age Gazette:

The photographing of applicants for employment, as suggested by Charles Burlingame in your issue of April 12, would be a most efficient means of identification. There are at least two electric lines—the New York State Railways (Rochester) and the Los Angeles Railway Corporation—that photograph their applicants, but on a big railway system with its many employing offices such a practice would be rather expensive. To derive full benefit from the plan three pictures would not be enough, as besides those filed one should be sent to each former employer to whom the applicant refers. Mr. Burlingame's high proportion of applicants with aliases—one-third to one-half—probably does not hold good the country over, but his claim that there should be some uniformity among the different roads in handling applications cannot be denied. A good means of identification is cheaply furnished in an applicant's signature written in full without initials, and his description, especially his age, or, better, the date of his birth. These details should accompany the inquiries sent to references and be carefully compared. Some roads make an attempt to carry out this idea, and those sufficiently interested in the subject to have special bureaus in charge of the employing of men meet with corresponding success in securing the most desirable employees.

OCCASIONAL.

A survey of the low lying area at the junction of the Illawarra & Bellmore lines, New South Wales, has been made to the public works department in connection with the proposed construction of a railway from Sydenham Station to Botany. This low lying land is a portion of the Tramvale flats, which a few years ago invariably became flooded during heavy rains. The construction by the government of two storm-water channels has eliminated most of the danger from floods and much of the land has recently been built upon.

THE DEVELOPMENT AND USE OF RAILS.

Abstracts of Two Papers Read at the Indiana Railway Commission's Hearing on the Question, February 20 and April 16.

BY P. H. DUDLEY,
Consulting Engineer, New York Central Lines.

Strap iron rails and wooden stringers were generaliy employed for the first railways, but they did not form a smooth and substantial track and by their frailty forced our civil and mechanical engineers to develop the American type of locomotive and equipment. It will be noticed from the table that in 1840 only 2,818 miles of railways had been constructed. Nearly all of the first companies were bankrupt and passed into receivers' hands, owing to the great expense and cost of operating on tracks which had been built as permanent structures to endure for many years, but which were destroyed by the generated wheel effects of three to four tons upon the drivers, and one and one-half to two tons on the wheels of the ordinary rolling stock.

All of the early strap iron rails were imported from England or Wales, as rolling mills had not been built in this country. They were increased to 1½ in. in thickness and 3 in. in width, but between 1840 and 1850 so many accidents occurred from their use that in New York state, in 1844, their further employment was discontinued.

In 1830 Robert Stevens designed a "T" section of iron rail, nearly similar to those of the present type in use, for the Camden & Amboy Railroad. Pear-shaped iron rails were imported from England, and many of these, made out of refined iron, lasted several years under the light wheel loads, but when they increased to 10,000 or 12,000 lbs. upon the drivers the rails failed with great rapidity.

The physical properties of the iron proved inadequate, and when the speeds of trains attained 25 and 30 miles per hour the iron rails broke and laminated with such rapidity that the operations of the railways were conducted with great difficulty and expense. Broken rails were so numerous in the sixties that the railway officials tried the Booth steel-capped rail, which had a surface of about ¼ in. of crucible steel rolled on to a stem of wrought iron, but the surfaces were not welded and did not last long in the track.

Bessemer rails were rolled in England and tried by many of the railways, commencing about 1860, and in 1863 a number of trial orders were placed for similar rails in this country. The cost at the time of $100 to $120 per ton, gold, to which was added the premium of 40 or more per cent. in our currency, forced the railways to use as light a section as possible. Many of the sections of 56 to 58 lbs. per yard, 4 in. in height with a comparatively thick base but thin heads, were imported and tried. The steel rails in places of severe service would outlast 10 to 15 of the best iron rails which could be secured. Bessemer steel works were inaugurated in this country about 1866.

The sections were only 4 to 4¼ in. in height, and the deflections of the rails under the passing wheel loads permitted nearly the entire concentration of the wheel load on each cross-tie. The rail sections were stiff enough to distribute only a small part of the load in the wheel spacing and while the cost of maintenance for track work was high the loss of metal per yard was quite small. The light sections did not permit the development of the wheel loads and enlargement of the locomotives and cars as much as was desired by the railways for the demands of transportation. The loss of metal per yard in service proved to be so small that the consensus of opinion was general that from the excellent wear of the thin-headed sections a residual section might be designed of sufficient strength to carry the traffic and add to the head the amount of metal desired for wear. The base of the rails were made thinner and 50 per cent. or more of metal put into the heads of the rails.

The change in this form of section was made by a committee of engineers in about 1870 and sections they recommended were in service in 1874. The excellent results which they expected to obtain were not secured in subsequent service and the increased demands of transportation for better and smoother rails that would reduce the generated wheel effects of the moving trains were so important and there was such a diversity of opinion in reference to the sections of rails that in 1878 I designed my track indicator and constructed a car in which the measurements of the undulations of the tracks could be made. Passing over the New York Central & Hudson River, the Boston & Albany, Philadelphia & Reading and Baltimore & Ohio, it was found that rails in the track had characteristic permanent sets. These I could classify, and while the companies thought they could make their tracks as smooth as they desired by more ballast and labor, it was shown by repeated inspection of the tracks that while they might temporarily improve the surface it was but a short time before it was more or less out of surface.

This led to the design of the 5-in. 80-lb. rail for the New York Central & Hudson River in 1883, which was rolled and placed in the tracks in 1884. By adding 15 lbs. to the ordinary 65-lb., 4½-in. rails, then used for the heaviest service, and making an 80-lb. section, 5 in. high, the actual stiffness of the section was increased 66 per cent. There was a great difference of opinion as to what would be the value of the increased stiffness for track purposes, the majority of opinions being that the value obtained would not be equal to the increased cost. The section was rolled and placed in the tracks in July, 1884, and demonstrated at once that the increased stiffness in the rail was of decided advantage to the stability and capacity of the track, and raised the standard of maintenance.

Several of the eastern roads adopted either a 5-in. 80-lb. section or one of heavier weight, the Pennsylvania Railroad making a 5-in. 85-lb. section.

It has often been stated that the reason why the former rails seem to last so well was due to the elimination of the poorer quality of rails by the service in the track. This statement is not the complete explanation. The older rails were cold rolled by the light wheel loads until the surface was sufficiently hardened to bear the recent heavier loads without much increased abrasion. New rails of the same section and practically the same physical properties would, when subjected to heavier wheel loads, lose more of the metal by wear, before the surface was rolled as hard as the former sections, and their rate would be much faster.

It is not considered advisable at the present time to make the composition of the rails which are to be subjected to the present heavy wheel loads so hard that at first they will entirely resist the cold rolling effect of the passing wheels. It is better to make the physical properties of the rails such that a slight flow of the metal will take place under the various worn wheel treads which will run over the rails, and in this way the surface will accommodate itself to the average treads passing over the heads, gradually becoming hard, until in a short time the flow is practically arrested. In rails which are too soft the surface may be worn away by the wheel loads before it becomes sufficiently hardened for the long wear, or the drivers slip on the rails, producing a layer so hard as to require their removal from the track.

The table shows some important statistics. The mileage shown for 1830 to 1850 had been constructed mostly with strap iron rails. The mileage built between 1850 and 1870 was mostly with iron rails, though about one-fifth was with steel rails. The mileage for 1880 was more than one-half of it laid with steel rails, while for 1890, 1900 and 1910, the mileage would be mostly

steel. It would have been impossible to have constructed the mileage shown for 1910 without the invention of Bessemer steel. We now have in the United States about 40,000,000 tons of steel in the track, of which 2,500,000 tons are of basic open hearth steel.

Basic Bessemer steel and basic open hearth steels are used abroad in Germany, England, also in Africa, and it is stated that the wear on the rails under their light wheel loads, particularly on the curves, is much more rapid than is desired. The temperatures in those countries do not fall as low as they do in our northern states and Canada. They use higher carbon rails in France as a rule than we do in this country, with excellent effect. Their wheel loads are also much lighter and they maintain their rotundity for a longer period than the wheels here, under our heavier wheel loads and long distance runs.

oration in the product. This was in a partial sense true, for with the larger output, the same Bessemer converters were operated more rapidly, reducing the time for recarburizing and allowing the deoxidation products of the bath of metal to escape in the ladle before teaming the ingots. The latter were poured longer without increasing the size of the moulds and this led to more segregation and greater difficulty in securing sound ingots and rails free from pipes. There were many requirements of good mill practice that in the demand for greater output were unconsciously overlooked without any intention of reducing the quality of the product.

The most serious difficulty was the constant increase in phosphorus content owing to the rapid exhaustion of low phosphorus Bessemer ores, which led to the introduction of the basic open hearth furnaces which are made with a neu-

Development of Railways in the United States.

	1830.	1840.	1850.	1860.	1870.	1880.	1890.	1900.	1910.
Miles of lines operated exclusive of side tracks, yards and terminals	23	2,818	9,021	30,626	52,922	93,296	163,597	192,556	239,652
Miles of all tracks	.....	.....	.....	.....	.....	.....	199,875	258,784	349,159
Tons of freight one mile	.....	.....	.....	.....	.....	.....	76,207,047	141,599,159	255,528,643
Passengers one mile	.....	.....	.....	.....	.....	.....	11,847,785	16,039,007	33,949,936
Locomotive weights without tenders (tons)	.....	.....	.....	.....	.....	.....	1,265,880	2,023,702	4,271,000
Freight cars—total capacity (tons)	.....	.....	.....	.....	.....	.....	19,288,301	37,210,720	74,043,000

It was possible to obtain ores from 1890 to 1898 to make Bessemer rails of 0.06 phosphorus with carbon ranging from 0.60 to 0.65 per cent. for 80 and 100 lb. sections, the metal being tough and ductile, and I made over 500,000 tons of about that composition. The specifications stipulated that 90 per cent. of the butts, one from each heat, should withstand a weight of 2,000 lbs., falling 20 ft., without breaking, and the heats from which these test pieces were taken which gave 4 per cent. elongation per inch before breaking, would be accepted. Such a grade of steel was made for the Boston and Albany, and the New York Central & Hudson River, until the low phosphorus ores were exhausted. The metal was so tenacious that but few breakages occurred in the winter, and practically none in the summer. I made the rails mostly in two or three rail ingots for 30-ft. rails, and for all the three rail ingots marked the top rail "A," the second "B," and the third or last rail of the ingot "C."

The subsequent service of the rails in the tracks furnished the first opportunity for studying the wear from different portions of the ingots. The "A" rails wore the most rapidly under heavy traffic, but the breakages were not much in excess of either the "B" or "C" rails. It was the results of such advice tests that led me to oppose the adoption of a 20 or 25 per cent. discard from the bloom in 1907, and to contend for a provision in the specification to shear the bloom until the metal cuts sound. The number of rails which have proven defective after a short service rolled with 20 to 25 per cent. discard from the ingot, have demonstrated definitely that such a percentage does not insure pipeless or sound rails, as proper mill practice is often neglected for such a percentage of discard.

The stiffer sections require higher physical properties of metal than the early weaker sections to withstand the augmented intensities of the wheel pressures. They do not deflect as much under the wheel loads, consequently the area of contact between the wheels and the rails is less than that obtained on the lighter rail sections and the lesser wheel loads preceding 1890. I knew the intensity of the pressures between the wheel contacts and the rails would be increased, and before beginning the manufacture of the stiffer sections for the New York Central & Hudson River and the Boston & Albany, I advised that it would be necessary to increase the physical properties of the metal to withstand the augmented intensity of the wheel pressures.

The difficulty of securing low phosphorus ores for all of the rails, gradually led to a decided increase of the phosphorus content in the rails. Many fractures developed under the heavier wheel loads and greater speeds during the winter, and led to the opinion that there was decided deteritral lining, permitting lime to be used to absorb the greater percentage of phosphorus in the bath of metal. This enabled ores to be used for rails, which were not available for the acid Bessemer process, and at the same time exchanged for phosphorus the better element of carbon, which, within proper limits, adds toughness and tenacity to the metal. The basic open hearth process requires a larger plant than the Bessemer, and a greater number of furnaces to furnish a given output. The process of making a single basic open hearth melt, occupies eight to twelve hours, while ten to twenty tons of Bessemer metal can be converted in as many minutes.

The wheel loads of a locomotive or car running over the rails at 30 miles per hour, travel 44 ft., or 528 in. per second, at 60 miles, 88 ft., or 1,056 in., and at 90 miles, 132 ft., or 1,584 in. The stremmatograph, an instrument for measuring the strains in rails under moving trains, indicates that while the length of the rail under the wheel contact affected by the positive bending moments will vary, the maximum strains in the base and head are reversed in one-half the length of the span of the wheel spacing as before stated.

A 7-ft. wheel spacing is common for the drivers of the Atlantic type of engines. To run 42 in., the length of the half space at a speed of 30 miles per hour would take 42/528 of a second, for 60 miles per hour 42/1056 of a second, and at 90 miles per hour 42/1584 of a second. The base and head of the rail are under strains of compression and tension which reverse with every passing wheel. These reversals may become so rapid for high speeds, that the metal in the rails capable of distributing the strains with ample factors of safety for speeds of 50 to 60 miles per hour, is more rapidly strained at higher speeds.

The improvements for the present facilities of transportation have not been confined wholly to the rail section in the past three decades, but have included the entire permanent way. The roadbed is better drained and ballasted, the crossties creosoted, with tie plates for the rail seats, and screws are being substituted for hook spikes, while the standards of maintenance throughout are higher. The undulations in the tracks as measured by my track indicator, which averaged 8 ft. per mile in 1881, were reduced to 2 ft. in 1900 on the stiffer and heavier rails for the Boston & Albany and New York Central & Hudson River. Similar reductions have been made by other trunk lines.

The heaviest axle load in 1881 was, for a few locomotives, 31,000 lbs., increased to 40,000 lbs. in 1890, and now 59,000 to 60,000 lbs. for many passenger locomotives, and run at

speeds over 60 miles per hour. The undulations since on 100-lb. rails have only increased to 2½ or 3 ft. per mile under the heavier axle loads and higher speeds.

The correlations between the moving trains and the permanent way are becoming better understood each year, and there does not seem to be any reason why the strains in the rails cannot be lessened in the future for the present loads and speds.

MILL PRACTICE.

The results of extended service tests show that the bath of metal for the present rails must be well purified and the iron must be comparatively free from everything but the percentages of the metalloids and elements of the alloy, to make the steel, and then must be teemed in sound ingots. There are important principles in mill practices which must be observed and carried out in consecutive order and at the proper moment to insure that sound ingots are made. After being stripped, they must be promptly charged into the reheating furnace to equalize the heat in the ingots, and then bloomed as quickly as possible to prevent shrinkage cavities developing in the best of steel before the ingots are rolled.

Ingots which are allowed to cool will develop cavities of 0.05 to 0.10 per cent. of the volume of the ingots. After these cavities are formed and cooled with more or less traces of slag in their interior, they cannot be welded in any subsequent heating or rolling. To make this plain, if an ingot of 8 or 9 cu. ft. of well-deoxidized steel, were allowed to cool, it would develop a shrinkage cavity of 120 to 180 cu. in. near the top of the ingot. If companion ingots were stripped and charged into the reheating furnaces, their heat equalized for 1¾ to 2 hours and then bloomed, the shrinkage cavity would only appear as a mere trace and be removed in the ordinary discard of the bloom crop. The making of sound ingots is now better understood than it was a few years ago, and it is also now a general practice at the mills to charge the ingots into the reheating furnace as soon as they are stripped and bloom them in their own equalized initial heat. This is done in systematic good mill practice and pipeless rails are produced out of ingots 20 x 24 in. on the base, 6 ft. in height and weighing 8,200 lbs.

The important step of the past year has been the increased purification of the bath of metal, which when rolled into rails, gives practically the full percentage of ductility due to the chemical composition. The specifications of the New York Central Lines for basic open hearth rails require three tests per melt, one made from the top crop from the second ingot, one from the middle, and one from the last ingot poured. Each of these tests must show a ductility of 6 per cent. for the maximum inch, or 5 per cent. for two consecutive inches in each of the three butts of the rail tested under the drop for acceptance of the melt.

The ductility of one test butt is completely exhausted by two or more blows of the drop, measured per inch, and recorded. This furnishes the exhausted ductility of the metal per inch which is obtained from the steel to compare with that which is possible from the chemical composition. The ductility per inch is obtained by stamping the butts to be tested on the base or head of the rail by a spacing bar of seven points accurately spaced 1 in. apart for 6 in. in length. This requires but a moment of time, and all the exhausted ductility can be obtained in three or four minutes' work. The fracture of the exhausted ductility test is also a soundness test of the metal similar to the nick tests in other specifications.

One of the large manufacturers, who at first did not think it possible to secure such uniform results as have been obtained, has now become so interested and considers the ductility tests so valuable for his own practice, that he proposes to make all open hearth rails under these tests whether the customers ask for them or not. The exhausted ductility gives a measure or standard of purification of the bath which they never had previous to the specifications of the New York Central Lines, and he proposes to adopt this as a standard practice. This of itself will insure a marked improvement in the metal entering into their open hearth rails.

The Pennsylvania Lines West of Pittsburgh will measure the ductility in their rail steel this year, while the American Railway Engineering Association has introduced a ductility test in its specifications, together with a nick test. Consequently the ductility of the steel for rails will receive more attention this year than ever before, and its importance will be better understood.

It seems probable that the exhausted ductility test for basic open hearth rails will become standard practice at all mills, so the work of each furnace and melter will be matters of record.

The melt of steel is usually rolled into rails in three to four hours after it is tapped and before another is ready from that furnace the ductility of the last melt is known and given to the melter. This measure of ductility has enabled the melters to purify the bath so completely that more uniform results are obtained from each melt than was believed possible by steel makers before this method was installed. It is an aid, and through the co-operation of the makers a more uniform grade of output of rails has been secured for service in the tracks.

It will be of interest to state that the chemical composition for the various weights of rail is calculated to give from three to four times the ductility in the steel for high speed trains, which is stipulated as the minimum for acceptance of the melts. It was possible after the melters had some experience in working under the specifications for the New York Central Lines to secure nearly the theoretical ductility probable for the chemical composition of the steel. To illustrate: 20,422 tons of 5⅛ in. 80-lb. rails were shipped, in which the average calculated ductility for the chemical composition was 21 per cent. per inch. Two hundred and eighty-eight melts were made, and in only two was the ductility as low as 8 per cent., while the average for all of the melts was 19.8 per cent. These 50,000 rails have withstood the service during the past winter with only two fractures and two half-moon brakes in the base, in temperatures of 40 deg. below zero for ten days duration, and in other places of 50 deg. below zero for one or two days duration.

Rails can be made for the requirements of slow heavy traffic of lesser ductility and greater abrasive resistance, than would be permissible for high speed passenger service. I have now the tabulated records for 106,000 tons of basic open hearth rails made at three mills in 1911, under the ductility tests, which passed through the winter under our heavy traffic and high speed trains with so few fractures in the different sections that the results are encouraging in the predominant desire and effort of the officials to fabricate high grade rails for absolute safety in service.

The most important event in the development of the agricultural and mineral resources of Tripoli, North Africa, took place when the government decided to build a railway from Tripoli to Ain-Zara, about 8 miles south toward the rich grazing hills of Gharian and the olive district, which lies 80 miles inland. All of the soil between the mountain range and the sea should give splendid crops of barley and wheat under intelligent cultivation and provide sufficient freight to make the railway a paying investment for the state. The line is nearly completed, and four 39-ton locomotives have been landed. About 150 workmen from Italy, regular employees of the railway department of the state, have been on the spot for over a month; ordinary laborers are receiving $1.40 per day, and section bosses $2.40, while in Italy they receive, respectively, one-half those wages. The ordinary Arab and Negro laborer of Tripoli is earning $0.50 per day, while last year at this time he was glad to receive $0.10 per day when he could find work. The line has 3-ft. gage and 55-lb. steel rails are being used. All of the rolling stocks is of Italian manufacture except the locomotives, which come from Berlin, Germany. No passenger cars have yet arrived.

OPPORTUNITY IN THE RAILWAY BUSINESS.*

BY SAMUEL O. DUNN,
Editor, *Railway Age Gazette.*

When I was invited to speak at your dinner it was suggested that I talk on Opportunity in the Railway Business. The first step necessary in the discussion of that subject is to define the word "opportunity." To most of us, I suppose, it means a chance to succeed. But neither does this definition really define; it is without form and void until we say what we mean by success. To many persons success consists in the accumulation of wealth. To others it is the winning of "that bauble, reputation." To others it is the securing and exercise of influence, power. To still others it is the accumulation of wealth, the winning of reputation and the acquirement and exercise of influence in well-balanced proportions. I don't know how it is with you, but the development of a well-rounded mind and character, and the acquirement and use of both the tangible and the intangible good things of life—of material means, of reputation, of intelligence, and of influence for the increase of human welfare—that is my conception of success. I have never for one instant envied any man who had well-filled money bags, a cold heart, an uncultured mind, and a want of public spirit: Likewise, I have never envied Goldsmith with his poetic genius, his spendthrift habits and his humiliating poverty, or Francis Villon, the beggar poet of France, dividing his time between the avocation of writing tuneful verse and the vocation of picking pockets and dodging the police.

MERIT VS. "PULL" ON THE RAILWAYS.

I know of no business which better offers to merit the chance both to accumulate a competency and to acquire and use influence for the public weal than does the railway industry in the United States. If you will read the muckraking magazines, which print everything but the truth, and sometimes even a little of that, you will learn that the only way a man can rise in the railway business is by pull. And when you learn that, you will learn what is not so. Indeed, if you read the muckraking magazines diligently enough, you will learn almost everything about the railway business that is not so. It used to be said that there were three kinds of lies—lies, damned lies and affidavits. The muckraking magazines have not been developed to this refinement of classification, and so they confine themselves to the second class. If the articles of the muckrakers about other large businesses in this country contain the same amount of truth as those they have written about the railway business, an attempt by a modern Munchausen to improve on their lucubrations would be an attempt—

> "To gild refined gold, to paint the lily,
> To throw a perfume on the violet."

However, what I had started to talk about was not muckraking, but pull as a means for advancement in the railway business. Far be it from me to say there is no such thing. There is. There are not a few men occupying important and profitable positions on railways who owe their advancement to one part of merit and nine parts of pull. But I dare say that pull has secured as few promotions and merit has secured as many, in proportion, in the railway business as in any other business in this country; and the higher the railway office the smaller is the number who have attained it by any means but proved efficiency. The man who begins with a dinner pail and ends in the president's office is still a big factor in the railway business.

MANY RISE FROM THE RANKS.

Eleven presidents of large roads have their offices in Chicago. These are Mr. Delano of the Wabash; Mr. Markham of the Illinois Central; Mr. Hetzler of the Chicago & Western Indiana; Mr. Ripley of the Santa Fe; Mr. Earling of the Chicago, Milwaukee & St. Paul; Mr. Winchell of the Frisco Lines; Mr. Felton of the Great Western; Mr. Mudge of the Rock Island Lines; Mr. Gardner of the North Western; Mr. Miller of the Burlington, and Mr. Harrison of the Monon. Of these eleven men no less than eight have been elected to their present offices within the last two and one-half years, although two of them had been presidents of steam roads before. Mr. Ripley, the dean, in point of service, of the railway presidents of Chicago, began railway service as a clerk; Mr. Earling, as a telegraph operator; Mr. Markham, as a section laborer; Mr. Winchell, as a clerk; Mr. Mudge, as a water boy on track work; Mr. Gardner, as a telegraph operator; and Mr. Miller, as a stenographer. Not one of these eight had the advantage of a college or university education. Mr. Delano, who is a graduate of Harvard, began railway work as a machinist's apprentice in the shops of the Burlington and rose, step by step, through the mechanical and operating departments. Mr. Hetzler, a graduate of the University of Michigan, began as an assistant civil engineer. Mr. Harrison, a graduate of Yale, entered railway service as a lawyer. Mr. Felton, a graduate of the Massachusetts Institute of Technology, began railway work as a rodman. If we extended the scope of our inquiry to include the antecedents of all the railway presidents, vice-presidents, general managers and traffic managers in the United States, we should find that they, like the presidents located at Chicago, have risen from the ranks and have risen by dint of hard work, ability and integrity.

My muckraking friends may agree that they have climbed by hard work and ability, but are likely to challenge the statement that they have climbed also by integrity. According to their notion apparently, to say that a man is a railway officer and also that he is honest is a contradiction in terms. Well, I have in my comparatively short life come in contact with all sorts and conditions of men. I have loaded header barges in the Kansas wheat fields. I have worked long days at the printer's case. I have served in country and city newspaper offices as a reporter and editor; and for several years I have been engaged in my present work, which has brought me constantly into contact with a multitude of railway officers in all parts of the United States. Based upon this contact with working men, with farmers, with newspapermen, with business men of all classes, I express the deliberate opinion that the railway officers of this country, not only in point of energy and ability, but also in point of integrity and public spirit, will measure up to the best standards of any other class of American citizens. To a public which has been regaled for years with stories of railway rebating, graft, corruption of politics, corruption of the courts, and so on, that statement may sound strangely. These evils have all existed to some extent, some of them to a very great extent, but the practice of basing sweeping generalizations regarding railway management as a whole on a relatively small number of cases of actual misconduct and corruption has given the general public an entirely wrong impression regarding the honesty and efficiency with which our railways have been operated and of those who have operated them.

SALARIES OF RAILWAY OFFICERS.

We have seen that most of the men occupying high positions in the railway service have come up from the ranks. What of the pecuniary rewards gained by those who rise in the railway business? There is a popular impression that the salaries paid to railway officers are very large. On the other hand, those who come in contact with railway officers often hear complaints from them that their salaries are small. The statistics of the Interstate Commerce Commission show that on June 30, 1910, the railways of the United States had 5,476 general officers who were paid salaries aggregating $17,949,017, an average of $3,277 each. They had, in the same year, 9,392 officers who are designated by the commission as "other officers," and who were paid $19,499,753, or $2,076 each. These figures certainly do not indicate that railway officers are paid excessive salaries, considering the

*An address delivered at the annual dinner of the Cornell University Association of Chicago, at Chicago, April 5, 1912.

hard work they have to do, the heavy responsibilities they have to bear, and the fact that most of them, owing to the very nature of the railway business, have to be away from their homes out on the lines a great deal of their time, supervising operation or seeking and developing traffic. The conclusion we must reach is that on the average railway officers are not highly paid.

You have often heard it said, and often read, that if the railways would reduce some of the "fancy" salaries they pay they could operate more cheaply and make lower rates. Some interesting comparisons, which are a rather effective answer to this statement, may be made between the total amounts annually expended by the railways for wages and salaries, their total operating expenses and the salaries received by their officers. The wages and salaries paid by the railways of the United States in the year ending June 30, 1910, aggregated $1,143,725,306. Of this amount only 1.5 per cent. was paid to the general officers, including presidents, vice-presidents, general managers, traffic managers, etc. The total amount paid to both general officers and other officers was but $37,448,770, or but 3.2 per cent. of the total salaries and wages paid. There are many classes of railway employees who received a great deal more in the aggregate than the officers. For example, enginemen received $91,323,678; conductors, $59,716,891; trainmen, $109,664,112; employees in the shops, about $360,000,000; section foremen and other track employees, about $170,000,000. So, you see, these railway officers with their "fancy" salaries did not get a very large part of the total expenditure for wages and salaries.

If you compare the salaries of officers with total operating expenses the figures become even more significant. The total operating expenses of the railways of the United States in 1910 were $1,822,630,433. Of this amount the total salaries of general officers were but nine-tenths of 1 per cent., and the salaries of all officers only 2 per cent. Of course, however, there are large prizes to be won in the railway business. Those who rise to the top are handsomely paid. Even their salaries are often greatly exaggerated, however.

I have seen the statement made in arguments for government ownership of railways that when the government took the roads over it would effect large savings by reducing or abolishing the inordinate salaries of railway presidents and vice-presidents. Did you ever consider how perfectly trifling an amount could be saved, and, on the other hand, how much might be lost, in that way? As we have seen, if all the official salaries were wiped out total operating expenses would be reduced only 2 per cent.; and fixed charges would be the same as before. The total earnings from operation of the Pennsylvania Railroad, an eastern road, in the fiscal year 1910 were $159,960,806, and its operating expenses were $109,890,246. The total earnings from operation of the Chicago, Burlington & Quincy, a western road, were $87,869,517, and its operating expenses were $63,010,965. Now, I do not know what salaries the presidents of the Pennsylvania and the Burlington receive, but is it not obvious that a corporation doing such an enormous business and having such enormous earnings and such enormous expenses could not afford to have a cheap man as president no matter how cheaply he might be got, while it could afford to hire the best man available, no matter how much he might cost? It might be very easy for these corporations to save a few thousand dollars a year by hiring men who would be willing to work for small salaries, but it would be equally easy for these cheaper men, by inefficient management, to lose the companies $1,000,000 for every thousand that was saved on their salaries. Conditions being what they are, it will probably remain true as long as the railways of the United States continue to be private property that those in the lower official ranks will be paid somewhat smaller salaries than they could get in more purely commercial businesses, but that very large prizes will be held out to stimulate them to labor for promotion to higher offices.

I express the opinion in passing that in proportion to their earnings and expenses the salaries paid by railways are smaller than those paid by any other class of American business concerns.

OPPORTUNITIES FOR PUBLIC SERVICE.

Men of really big minds and great souls do not, however, work for money alone. They want money, of course; as a railway friend of mine says when he "kicks" about his salary, "I have never yet discovered any good substitute for money." But while there are no good substitutes for it, there are some good complements of it. The best of these is the opportunity to render valuable services to the public, and no one has a better chance to do that than the railway officer. The railway business has come to be recognized as a quasi-public business. That makes its officers quasi-public officers. The railway manager is a trustee for the public as well as for his stockholders. It is his duty to his stockholders to try by every honorable means to secure for them a reasonable return upon their investment; that is what they employ him for. It is equally his duty to try to furnish the public good transportation service at reasonable rates. It was said by a wise one of old that no man can serve two masters. The railway man is striving to do this, and it is largely because he is that the results of his work are not always satisfactory to one or the other of his masters. To perform successfully the dual task of the modern railway manager requires a rare combination of qualities. On the one hand, he must be an executive of the highest order. No meaner talent can operate efficiently a great modern railway. On the other hand, he must be a statesman. He must devise and carry out policies that will inure to the good of the public; and he must also convince the public that he is doing so; and to devise, carry out, and, in the forum of public discussion, vindicate beneficial public policies is the very definition of statesmanship.

It is only within comparatively recent years that our present conception of the public nature of the service of railways and of the duties of their officers has developed. It has not been long since the public and railway managers regarded the railway as being as much a private concern as a newspaper or a corner grocery. It is true that this was a wrong conception, both of the economic and the legal character of the railway, but nevertheless it obtained generally both inside and outside of the transportation business, and it required years of legislation, litigation, agitation and discussion to develop and establish our present idea of both the legal and the economic character of transportation companies. This change has made it necessary for the railway manager to change his attitude both toward the railway which employs him and the public which it serves. Some railway managers have found this hard or impossible to do, just as always there are those of such conservatism or stiffness of character that they cannot adapt themselves to changing conditions. But a large majority of the responsible railway officers of today recognize the fact that the change has come, that the railway will be and ought to be in future subject to government regulation, that all the facts about its business with which the public is concerned must be opened up to the light of day, and that the rates charged and the service given must be made and kept such as to deserve and secure the approbation of an intelligent and exacting public sentiment.

The difficulties with which railway managers have to deal are much greater than most people know. This change in the relations of the roads with the public, with all the new regulation that produced and accompanied it—regulation regarding rates, operation, accounting and many other parts of the business, tending to reduce earnings and to increase operating expenses—came during a period of advancing prices and increasing wages, which was followed immediately by a period of financial crisis and industrial depression. These various, conflicting, powerful currents have made the railway ship most difficult to navigate; but railway managers have risen courageously and capably to the demands of the occasion. However, their problem of satisfying at once the owners of the railways and the public is not solved. It never will be finally solved. Railway management, this modern

Sisyphus, is condemned to roll its stone up hill each day only to have it roll back down each night. Changing conditions will ever present new and additional requirements that must be met. So, no matter how well the railway officers of today do their duty, there will be plenty of opportunity for work, for advancement, and for public service for those who come after them.

COLLEGE MEN IN RAILWAY SERVICE.

In an address to an audience like this, and on such a subject as this, something doubtless should be said regarding the opportunities in railway work for college and university men in particular. Most of the railway officers whom I mentioned in the early part of my remarks not only began in the ranks, but began without the aid of higher education. Let us hope that the time will never come in this great industry, devoted alike to the making of money and the rendering of a public service, when any man who enters its employment, whether educated or uneducated, Jew or Gentile, Greek or barbarian, will not have a chance, by the exercise of ability and energy, to rise to the top. It is probable, however, that the number who in future will advance from the ranks of labor to the higher official positions will be relatively smaller than it has been in the past, and that the number of highly educated men, especially those with technical educations, that advance to the top will be relatively larger. This seems probable for two reasons: First, the railway labor brotherhoods insist more strongly and effectively each year on observance of the rule of seniority in the making of promotions in train and engine service. The result is to compel the energetic and ambitious young men to wait for their promotions until the older ones get out of the way. Consequently, it is apt to take longer than formerly for really able workingmen to rise to the positions of yardmaster, train despatcher, road foreman of engines, etc., where they can attract the attention of their superiors and be in line for promotion; and when they do reach such positions they are apt to be too old to be promoted very high. This, however, does not apply to unorganized employees, such as clerks, stenographers, station agents, etc. The second reason why highly educated men are apt to rise to high positions in the future than has been the case heretofore is that in this day of specialization in the railway business, as well as other industries, there is an increasing demand for men with a technical equipment. The college man, therefore, probably has a better opportunity now in railway work than ever before.

One difficulty in the way of the college man's promotion is that, according to the testimony of many railway managers, he often displays a lack of tact and skill in the handling of men; and the "engineering of men," as my friend Major Hine calls it, is very much the most important branch of railway engineering. However, there are plenty of college graduates who have developed skill in the engineering of men and risen to high railway positions. There, for example, are Felton Julius Kruttschnitt, director of maintenance and operation of the Harriman Lines, a graduate of the engineering school of Washington and Lee University; Howard Elliott, president of the Northern Pacific, a civil engineer of Harvard University; F. A. Delano, president of the Wabash, also a Harvard man; Fairfax Harrison, president of the Chicago, Indianapolis & Louisville, a Yale man; S. M. Felton, president of the Great Western, a Massachusetts Institute of Technology man; the late F. C. Melcher, vice-president of the Rock Island Lines, a Tufts College civil engineer; J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe, a graduate of Worcester Polytechnic Institute; W. W. Atterbury, vice-president of the Pennsylvania Railroad, a Yale man; Horace G. Burt, formerly president of the Union Pacific, a Michigan man; and E. J. Pearson, vice-president of the Missouri Pacific, and H. I. Miller, formerly president of the Chicago & Eastern Illinois, both Cornell men, and no doubt in the future, as in the past, there will be many college men who will develop into good railway engineers of men.

In the past most of the college men who have entered railway service have been technically educated, and a large majority of these have gone into the mechanical and engineering departments and stayed there. It would seem that there is a great opportunity in railroading for college men, both technical and non-technical, and it also seems a mistake for so large a proportion of the technically educated to seek to become mechanical and engineering specialists. The mechanical and engineering officers are staff officers, while the operating man is a line officer. Now, in the long run there is more chance for advancement in the line than in the staff. The main function of a railway is, not to build and repair cars, not to build and maintain structures, but to get cars and trains loaded with freight and passengers over the road. All other functions are auxiliary to this. No matter how good a mechanical or civil engineer a man may be, he is not likely to become a general manager, a vice-president or a president unless he knows how to move the business, and it is these executive officers who give orders, not only to the men in the transportation department, but also to those in the technical departments. It would seem, therefore, that the college man who went directly from school into the operating department and began work as a station agent, or a yard clerk, or a clerk in the office of some operating officer, or perhaps a telephone operator, might have a better chance to rise than one who entered directly into technical work. There is no department of the railway business where there is more demand for educated and able men and that can offer better opportunity to them than the operating department.

However, whether the college man begins as a draftsman or an assistant engineer or a yard clerk or a telephone operator, in 99 cases out of 100, regardless of his educational equipment, regardless of his natural ability, regardless of his family connections, he will have to begin at the bottom at a very small salary and fight his way up in generous rivalry with thousands of other men who may have less than his amount of knowledge of science and literature, but who may have more than he has of the invaluable sort of knowledge of men and of the world that the able acquire in that largest of all university, the school of hard knocks." And regardless of where he starts, the man with the right kind of stuff in him will advance in the railway business because the railways are looking all the time for men with that kind of stuff in them; and, on the other hand, regardless of where he starts, the man who hasn't the right kind of stuff in him is pretty sure not to rise, because the railways are all the time getting rid of men who are not made of the right kind of stuff.

The Cochabamba to Tarata railway, Bolivia, is expected to reach Tarata in August or September of the present year. The roadbed, bridges, and culverts of the line are being solidly constructed, and the road when completed will be one of the best two republics already in operation.

The total mileage of railways in Victoria, Australia, at the end of 1910 was 3,514 miles, an increase of 75 miles over the previous year. At this time 196 miles of new lines were under construction. Gross earnings for the year 1910 were $22,711,101, and the expenditures were $13,694,873.

In western Australia there were 2,400 miles of railways open to traffic at the close of the year ended June 30, 1910. This was an increase of 258 miles over the previous year. At that time 475 miles were under construction. The gross earnings were $7,957,443; the expenditures, $5,330,973, and the net earnings $2,626,470.

Construction of the proposed railway from Condobolin to Broken Hill is regarded as necessary for the proper development of western New South Wales. It is believed that the opening of the Panama Canal will greatly increase the shipping to Sydney, and that if this line were linked with Perth, thus completing the transcontinental railway from east to west, the mails from England would be landed at Perth and sent by rail direct to Sydney.

DEFECTIVE BOX CARS AND DAMAGED FREIGHT.

Third Article. Poorly Designed and Built Sides and Ends Cause Large Loss by Leakage of Grain and Shifting Loads.

The first article in this series, in addition to considering the great expense to the railways due to damage and loss of freight caused by poorly constructed equipment, also covered pilfering from the cars which is encouraged by inefficient box car door fixtures. The second article in the series, which appeared in last week's issue, showed the effect of poor side door construction, and directed attention to satisfactory side door fixtures and designs. A better arrangement of grain door than is ordinarily used was described, and a scheme which has been successfully used for preventing the entrance of cinders and water around the edges of the ordinary box car side door, when the car is carrying flour or similar lading, was also illustrated.

DEFECTIVE BOX CAR SIDES.

The usual construction on the inside of a box car is to have a lining of material about 13/16 in. thick, which extends as high as the grain line of the car. To prevent any grain which might leak through the lining from remaining between it and the sheathing, the lining extends to within a couple of inches of the floor and a V strip is fitted over the joint between the floor and the

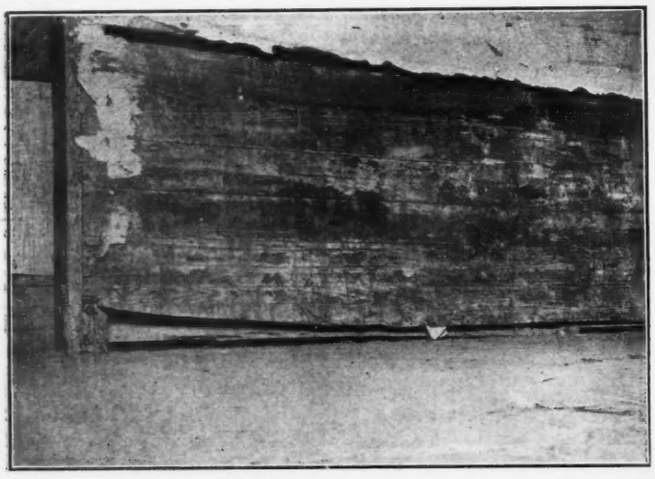


Fig. 27—Grain Strips Loose and Forced Upward.

outside sheathing, thus diverting any of the grain between the lining and the sheathing into the car when it is unloaded. Theoretically this is satisfactory, but practically, as applied under present conditions, it is more or less unsatisfactory and a nuisance.

In the first place the V strips are nailed to the floor and do not remain tight. Examination indicates that they probably become loosened in the following manner: The various members of a car loaded with grain or similar bulk material are under considerable stress while in transit, this stress varying in intensity as the car passes over rough track or crossings, or while the train is being made up, or as the cars are being shifted. As the frame is deflected, due to the varying stresses, the grain strips or the sheathing may be separated or spring away from each other slightly, allowing the smaller particles of grain or dirt to work between them; this prevents them from springing back into place when the stress is removed. As this action is repeated the strip becomes looser and looser and the grain may then drop down and work in between the steel side sill and the sheathing; this latter does not occur so easily where wooden side sills are used.

If a steel upper-frame construction is used and the grain strip is loose the steel braces and frame parts, which are filled with wood, afford numerous opportunities for the grain to leak down and out of the car. Of the 2,478 cars which leaked grain at Galveston, due to other defects than those of the grain doors (*Railway Age Gazette,* April 19, 1912, page 895), undoubtedly a fair proportion were due to the above mentioned cause. A few typical examples of cars defective in this respect, which were be-

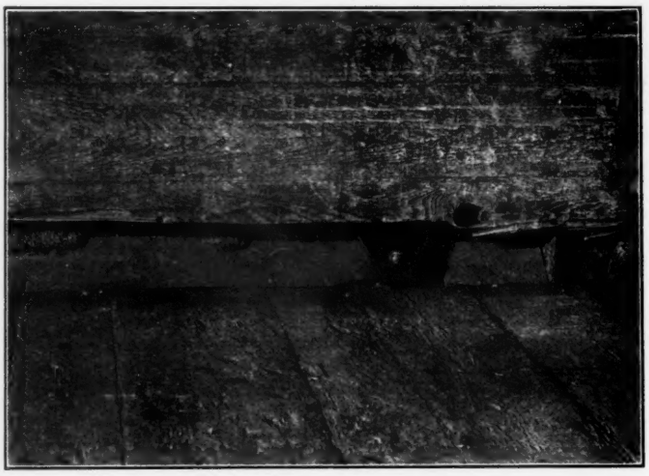


Fig. 28—Lower Part of Inside Lining Torn Away, Showing Grain Strips Near Bolster.

ing loaded with first class merchandise and were in the freight house, and not on the car repair track, are shown in the accompanying illustrations.

For instance, Fig. 27 shows a 40-ton car two or three years old, in which the grain or V strips were in some way forced up a considerable distance from the floor. Fig. 28 shows a 34-ft. car, 60,000 lb. capacity, in which the bottom board of the inside lining was partially torn away, leaving the grain strip and the

Fig. 29—Grain Strip Loosened; a Common Condition Even in Recently Built Box Cars.

lower part of the steel braces and post at the bolster exposed. The grain strip had been forced from the outside sheathing, allowing the grain to work in between. Looking along the side of the car from the side door the side was seen to be bulged out a considerable amount, and for a distance of three or four feet at the bolster. The other side of the car was in better condition.

A 40-ton box car in which the lower lining board has been removed is shown in Fig. 29. The distance between the top of the V strip and the sheathing measured from 5/8 in. to 3/4 in. Note also that the grain strip does not fit at all neatly between

Fig. 30—Outside Lining of Box Car Removed, Showing How Grain Had Worked in and Forced the Sheathing Loose.

the brace and the post. This condition is noticeable even in comparatively new cars, and they must have been turned out from the builder's shops in this way. It does not appear like a serious condition until the sheathing is ripped off. This was

Fig. 31—An Enlarged View of a Portion of the Illustration Shown in Fig. 30.

done in the case of another car of the same series, in which the grain strips had become loose and were forced out of place. The results are shown in Figs. 30 and 31. This car was less than three years old. Surely, even if the leakage of grain was not serious, the unsanitary condition formed by having this collection of decaying matter in the framework of the car is not a pleasant thing to contemplate. The deterioration of the car must be greatly assisted by a condition of this sort.

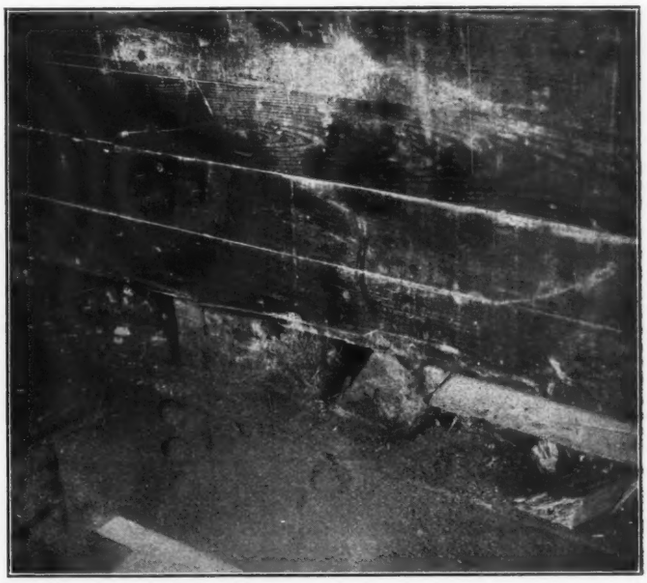


Fig. 32—Floor of Box Car Removed at Bolster Showing Poor Construction from Grain Leakage Standpoint.

In another case the floor of one of these cars was removed at the body bolster, presenting a similar condition of affairs, as shown in Fig. 32. Unfortunately most of the grain and loose material which had worked in between the various members had been cleared away when the picture was taken, but the cracks and crevices between the steel parts of the framework and the wooden filling blocks are clearly shown. Another view

Fig. 33—Another View in the Steel Frame Box Car from Which the Floor Had Been Removed at Bolster.

of the same part of the car is shown in Fig. 33. After these two views were taken the sheathing was ripped away on the outside and the loose grain and refuse was scraped off to show how loosely the wooden parts of the framework are fitted to the steel parts (Fig. 34). If the grain strip between the floor and the side of one of these cars becomes loosened or defective there is nothing to prevent the leakage of the grain, etc. Two

or three suggestions have been made as to how this condition might be remedied. One railway at least, has tried bringing the inside lining down to the floor and using a V strip at the joint, but such strips are usually ripped away within a very short time by the lading in the car. Another road is getting better results by using sixteen-penny nails to hold the strips,

Fig. 34—Showing Poor Construction Where Steel and Wooden Parts of Car Are Fitted Together.

and still another is contemplating bolting the strips in place. This latter method would undoubtedly be a considerable improvement over the conditions as ordinarily found. On the Canadian Pacific steel frame box cars, the framework is on the outside with the sheathing on the inside. The sheathing is 1¾ in. thick, and is joined or fitted to the floor planks as shown in Fig. 35. As both the lining and floor planks are securely bolted to the steel framework, and provision is made for taking up the shrink-

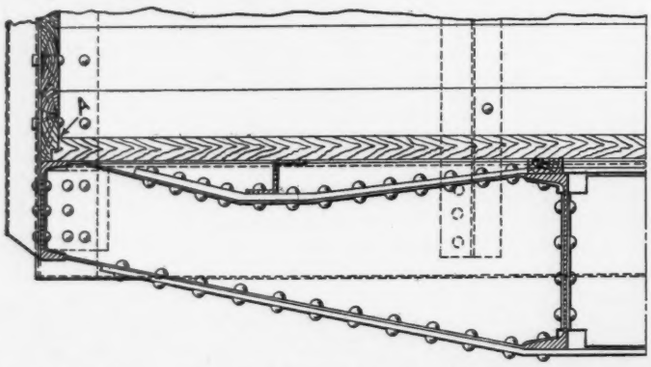


Fig. 35—Joint Between Floor and Sheathing on Canadian Pacific Steel Frame Box Cars.

age of the lining, there is little possibility of the joint between the lining and floor members opening up and allowing the grain to leak out.

WEAK ENDS.

The poor end construction on the average box car is responsible not only for considerable loss due to the leakage of grain and similar materials, but also in many cases for damage caused by shifting loads. The end ordinarily has a grain lining on the inside similar to that used on the sides of the car, and consisting of 13/16 in. material. This is not nearly heavy enough, because in the case of lumber and lading of this sort the load very often shifts, due to the shocks from coupling, etc., crushing through the thin lining. The inside lining on the standard 40-ton Santa Fe box cars is made of floor planks 1¾ in. thick. This prevents a large part of the damage due to the shifting of the lading. Ordinary forms of outside end construction are shown in Figs. 36, 37 and 38. Where the inside lining is only 13/16 in. thick, and it does become damaged, the outside lining shown in these illustrations offers very little resistance to pressure from the inside. The condition shown in Figs. 39 and 40 is not at all uncommon on cars constructed in this way.

Much has been said about the relative merits of different types

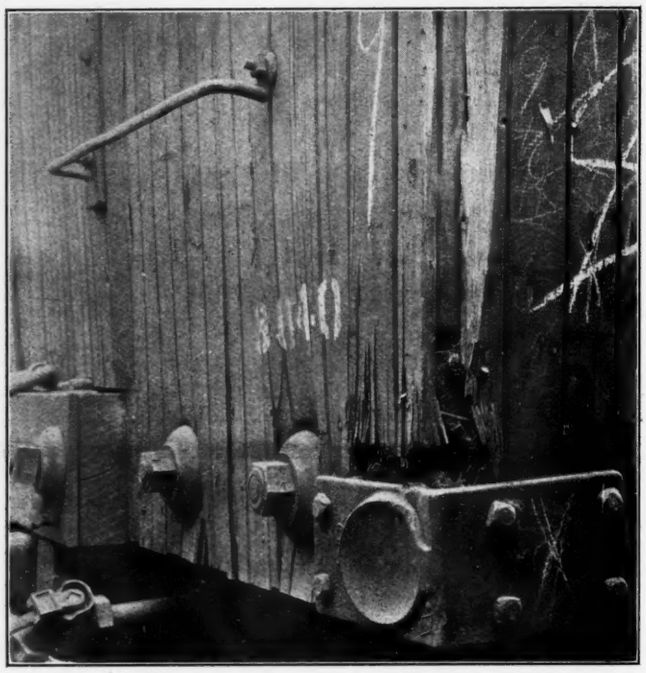


Fig. 36—A Poorly Constructed Box Car End.

of draft gear and the necessity of higher capacity gears. An examination of the draft gears under a number of box cars would seem to indicate that while the draft gear question needs considerable attention, it is not nearly so important at the present stage of the game as providing a better fastening of the gear to the underframe of the car, and this is especially true where

Fig. 37—An Average Type of Box Car End Construction.

wooden draft sills are used. In many cases conditions could be improved by using more and larger bolts for fastening the draft lugs to the underframe. In other cases the construction is such that there is little possibility of the gear remaining rigidly attached to the car after it has been in service for a few weeks.

Examples of the effect of defective draft gear attachments

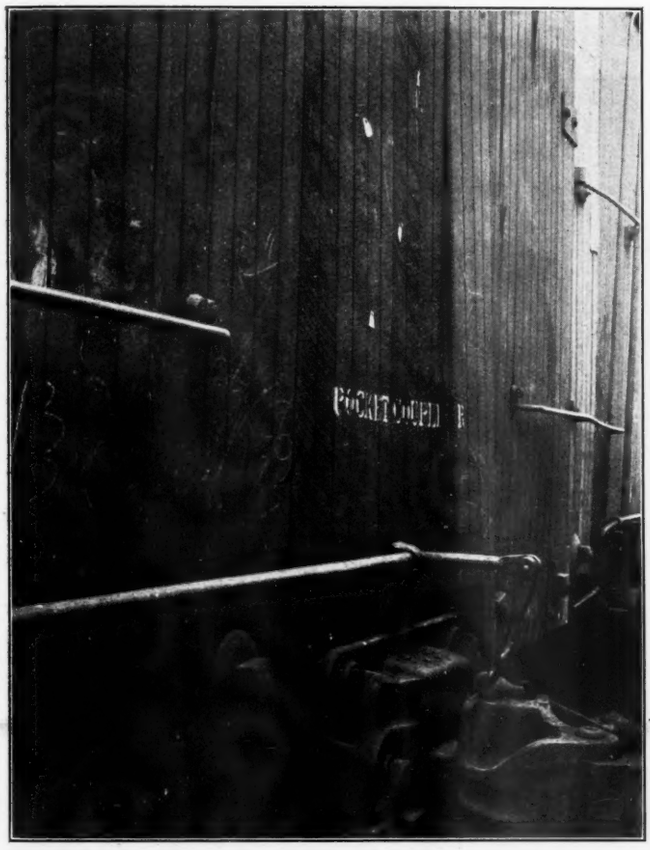


Fig. 39—Result of Weak Inside End Construction, Allowing Load to Shift.

Fig. 40—Another Example Showing Result of Weak Box Car End Construction.

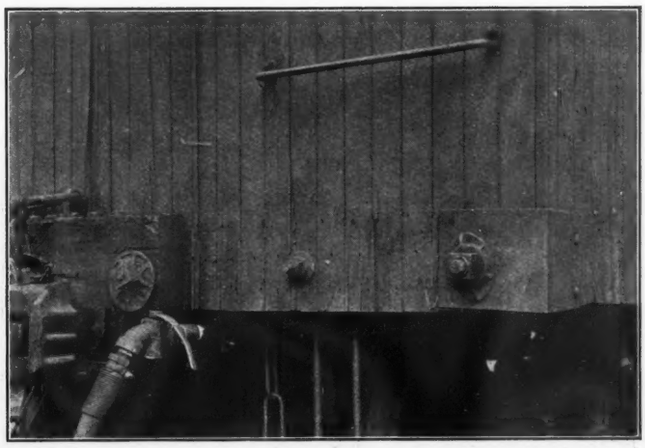


Fig. 38—Not a Strong End Construction.

are shown in Figs. 41 and 42. In the first case the striking block to which the ends of the draft sills were attached had dropped down about 2 in. below its normal position. In the second, the dead block was down 1⅜ in., and there was a space of from ½ in. to ⅝ in. between it and the sheathing. The effect of this

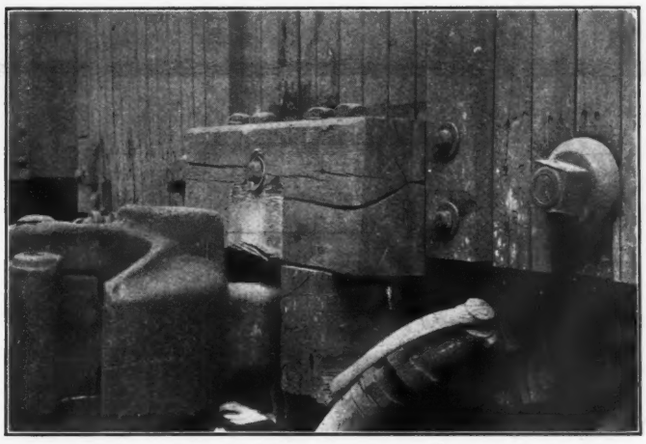


Fig. 41—A Draft Gear Insecurely Attached; Note Where the Loose Dead Wood Has Worn the Sheathing.

on the end of the car may readily be conceived. For instance, an inside view of the end of the car, which is shown in Fig. 42, is reproduced in Fig. 43, showing clearly the large hole through the end of the car which was caused by the repeated movements back and forth of the loose deadwood. This may seem to many to be an exaggerated case, but it must be remem-

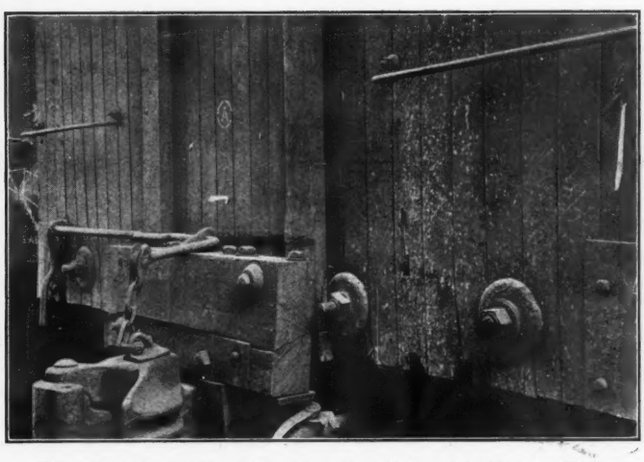


Fig. 42—Many Cars Are in a Condition Similar to This.

bered that very much smaller defects, which cannot be shown so clearly by the camera, and of which numerous illustrations may be found in any lot of box cars which are set out for loading at a freight house, will allow the leakage of a very considerable amount of grain or similar material.

Fig. 43—An Inside End View of the Car Shown in Fig. 42.

The end construction shown in Fig. 44 was used on a large number of 40-ton box cars that were designed and built three or four years ago, and which were widely heralded at the time of their construction, because of their light weight and low cost. The draft timbers did not extend beyond the end sill and the

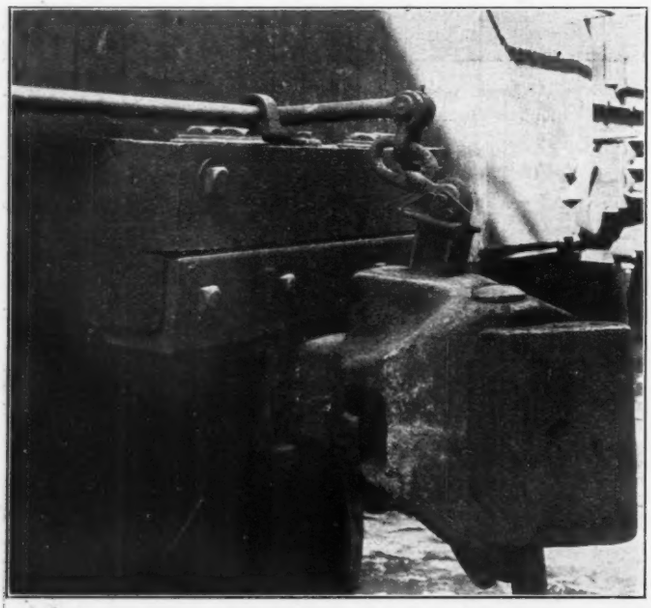


Fig. 44—A Poor Coupler and Dead Wood Attachment.

coupler carry iron was bolted to the dead wood, as shown. There is no way of estimating how much it has cost the company to maintain these ends, but it is known that claims for leakage of grain against the cars, even when they had only been out of the shops a short time, were excessive and this leakage occurred largely at the ends of the cars.

The end construction shown in Fig. 45 is a great improvement over the constructions which have been shown, more par-

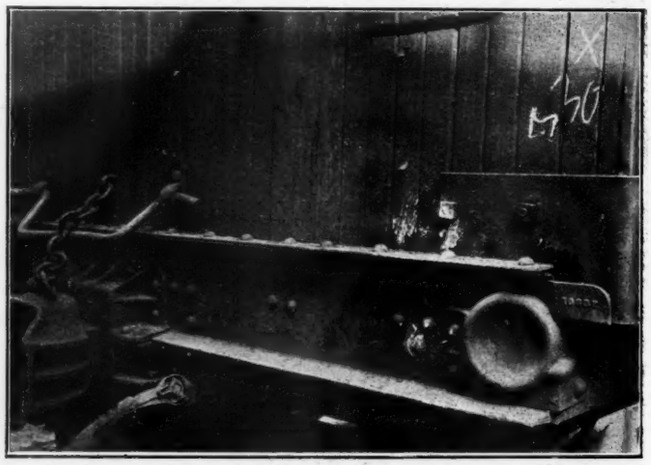


Fig. 45—A Better Form of End Sill and Coupler Attachment.

ticularly because it affords a much more rigid attachment for the draft gear. This car, however, has a thin inside end lining

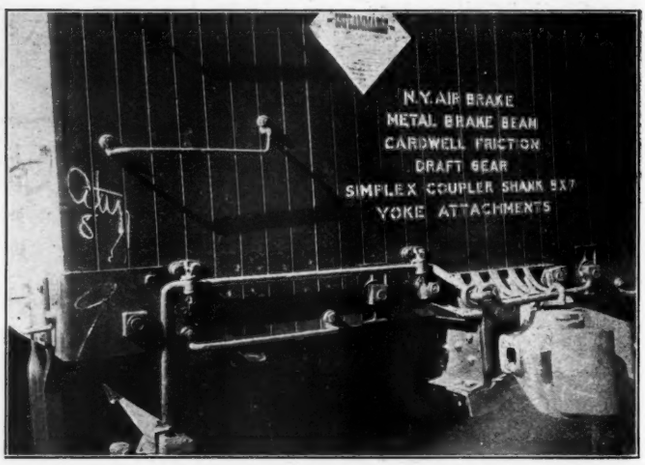


Fig. 46—A Good Coupler Attachment.

and the outside sheathing is fastened in the usual manner. Another illustration of a rigid draft gear attachment is shown

Fig. 47—An Exceptionally Good End Construction Used on Santa Fe Box Cars.

in Fig. 46, and is used on the new refrigerator cars which are being delivered to the Frisco. An especially good end construction, both as regards the attachment of the draft gear at the end of the car and of the construction itself, is shown in Figs. 47 and 48. The draft gear is carried by steel draft sills, which

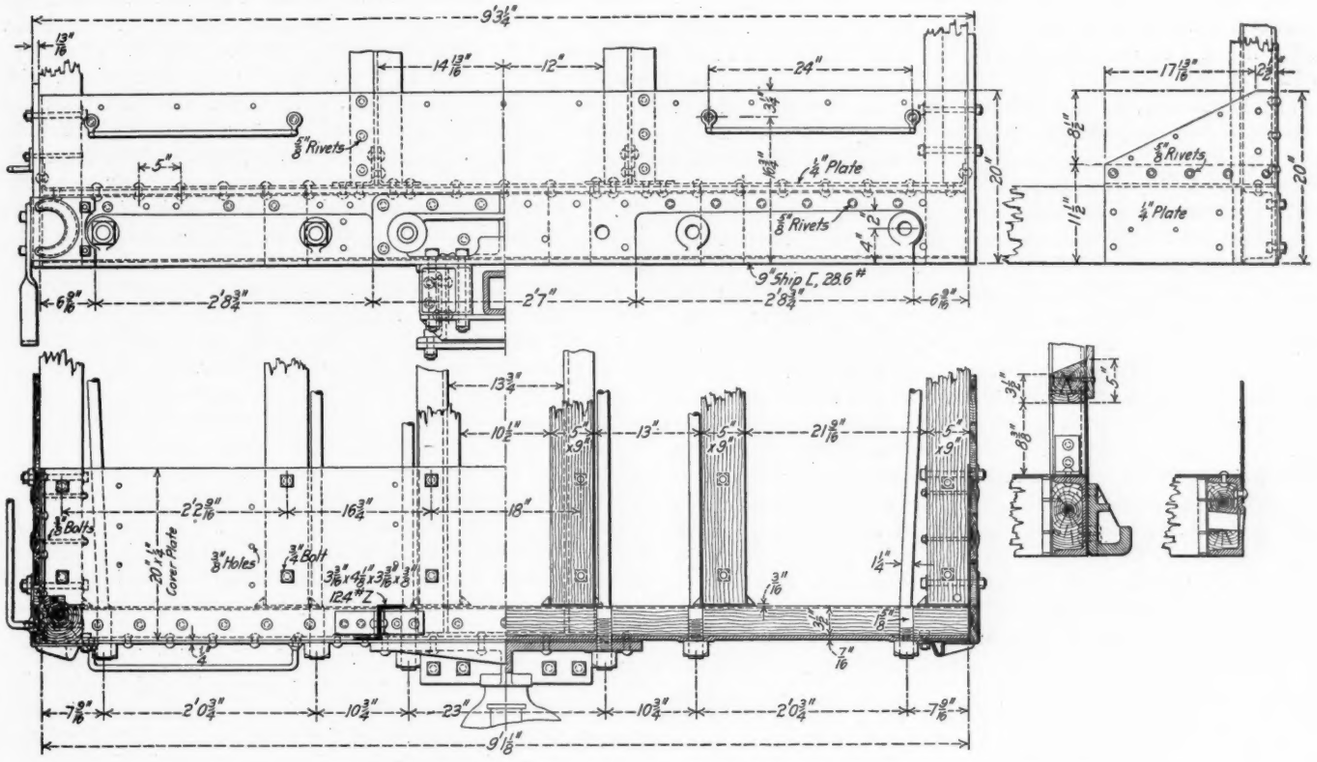


Fig. 48—Details of End Construction of Santa Fe Box Cars.

are securely bolted to the wooden underframe of the car. The dead block is made of cast steel, as shown in Fig. 49. The end sill consists of a heavy channel, 28.6 lb. per foot, which is filled with a wooden block 2½ in. thick. The ¼ in. plate, which is riveted to the web of the channel and extends up underneath the sheathing, is bent at the corners and extends back along the sides for a distance of about 20 in. The ¼ in. cover plate, which extends the full width of the car and is 20 in. wide, is riveted to the top flange of the end sill channel, and is turned up at the sides and riveted to the end plate above mentioned.

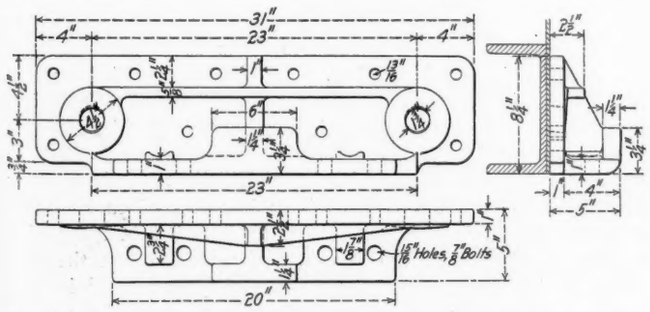


Fig. 49—Cast-Steel Dead Block Used on Santa Fe Box Car.

This not only makes a strong tight end but also provides a good stiff corner construction. The sheathing is held to the frame by bolts and clamps instead of being nailed to it. The small malleable iron clamps extend over the joints, as shown, and keep them grain tight. In addition the inside lining of the car at the ends is 1¾ in. thick. The two wooden end posts are reinforced by 3 3/16 in. x 4⅛ in. x 3 3/16 in. x ⅜ in. Z bars weighing 12.4 lb. per foot. This makes one of the most satisfactory end constructions now in use on box cars in this country. The heavy inside end lining backed by the strong frame prevents the ends from being bulged out or destroyed by shifting loads. The rigid attachment of the draft gear to the sills and the cast steel dead block, in connection with the strong end construction, prevent the damage which frequently results from weak ends and poorly attached draft gears. The arrangement of steel plates and the use of bolts and clamps for holding the wooden sheathing prevent any possibility of grain leakage.

(To be continued.)

The contract for the building of the new Hauhenstein tunnel in the line of the St. Gotthard road, Switzerland, has been awarded to a Berlin firm. The section between Basel and Olten, with the already existing Hauhenstein tunnel, 8,184 ft. long, has such a steep grade that the steadily increasing traffic can no longer be carried on according to the schedule. There is no other way to improve the conditions than to partly move the line, so as to get more favorable grades and curves. According to the plans of the general management of the Swiss national railways this new line will branch off from the old, back of the station at Siffach; run eastward to Gelterkinden, and then take an almost southerly direction and in the rear of the Tecknang station enter the new tunnel which is to be built, and which it will leave shortly before it crosses the river Aare; after which it will reach the station at Olten. The new line is almost exactly 10 miles long and is 364 ft. shorter than the present one. The crest lies 336 ft. lower. The steepest grade is 10.5 per cent., as against 26.6 per cent. of the old line; in the southern leg of the tunnel there is a grade of 7.5 per cent. for a distance of four miles. The shortening of the distance from Basel to Olten amounts to 19 miles, which will permit cutting down the transit time of the fast and ordinary trains from 15 to 20 minutes, and that for freight trains 25 minutes. In the tenders last August there were four bids; two Swiss, one French and one German. The tender of the latter, was $381,000 higher than the estimate of the management of the road, but below those of the other bidding firms by from $309,500 to $1,024,000. In a subsequent tender, the German firm, although it had increased its first bid by $171,400 was the lowest bidder.

THE HUDSON BAY ROUTE: A NEW OUTLET FOR CANADIAN WHEAT.*

BY AVARD LONGLEY BISHOP.

That adequate rail and water transportation facilities represent a basic factor in nation building, is a maxim which is appreciated more than ordinarily by the people of Canada. With them it is a well-recognized fact—one which has possessed itself of the public mind—that their potential forest, agricultural and mineral resources, all of which are known to be abundant, and not be economically utilized until the country is opened up by railways and improved by artificial waterways. The strenuous efforts which they have put forth during the last two or three decades to supply themselves with the necessary transportation systems have been such as to attract attention, if not the admiration, of the rest of the civilized world.

And notwithstanding the fact that already Canada has the greatest railway mileage in proportion to population of any country in the world, with possibly one or two minor exceptions, it would seem as if she were just entering now upon an era of great expansion in railway building. Within recent years the most pressing transportation problems have arisen as a result of the settlement of the West, especially of the prairie provinces—Manitoba, Saskatchewan and Alberta. With the later movement of population westward, the center of wheat production has shifted westward also, until at the present time it is somewhere within the limits of the three prairie provinces. This is shown by the fact that in 1911, Manitoba, Saskatchewan and Alberta together produced 194,083,000 bushels of wheat out of a total of 215,851,000 for the whole of Canada. The realization is just dawning upon the people of the United States and Canada alike that a large, if not the best, part of the wheat belt on the plains of North America lies north of the forty-ninth parallel of latitude.

Just how many million acres of land are available here for the growth of this cereal it is impossible with any degree of accuracy to estimate. There seems to be pretty general agreement, however, that within a decade or two Canada will be exporting several hundred millions of bushels annually. By far the largest proportion of this will undoubtedly be grown in the three prairie provinces. From the valley of the Red river in southeastern Manitoba, a wheat belt 200 miles or more in width stretches away to the northwest for hundreds of miles through Manitoba, Saskatchewan and Alberta. The average yield per acre is considerably above that of the best spring wheat lands in the United States, and already in 1911 the crop had amounted to over 194,000,000 bushels. Yet less than 10,000,000 acres have ever been planted in any one year—a very small fraction of the land known to be available for wheat. Is it little wonder, then, that some of Canada's leading public men are looking to the northwest to produce in the not distant future a billion bushels of this cereal annually.

NEED FOR ADDITIONAL RAILWAYS.

It should be mentioned in passing that wheat is by no means the only source of agricultural wealth in this region. In addition to important crops of potatoes, turnips, peas, flax, etc., there were produced in 1911 over 24,000,000 bushels of barley and 212,000,000 bushels of oats. The crop which already figures most prominently in the export trade, however, and the one which, as has just been shown, promises the most for the future is wheat. Probably a portion of the surplus will seek a market south of the forty-ninth parallel. The greater quantity, however, is pretty sure to cross the Atlantic. Accordingly, sufficient and adequate transportation facilities must always be available to move the surplus to the seaboard, otherwise great loss will incur to the Canadian farmer, and the healthful economic development of the West will be retarded.

In spite of the rapid growth of the railway net in the Canadian wheat belt, the grain traffic continues to suffer from congestion. Such a state of affairs naturally stimulated the demand for more outlets. If the present crop cannot be handled adequately, what will be the situation, it is asked, when a crop equal to several times that of the present is harvested? The building of the Canadian Northern and the Grand Trunk Pacific Railways does not seem to furnish a satisfactory solution to the problem. Some other supplementary route must be provided. Absurd as the scheme may seem at first thought to one unacquainted with climatic conditions in Canada, it is true, nevertheless, that the people of the prairie provinces have been clamoring for several years past for a railway to Hudson bay to supplement the existing transportation routes to the seaboard. Their demands, which have furnished considerable political capital in the provinces of Manitoba, Saskatchewan and Alberta, and which have provoked lengthy discussions in the Dominion parliament, have at last borne fruit. For the government has already appropriated nearly $1,700,000 for the project. Contracts have been signed for the construction of a bridge over the Saskatchewan river at The Pas, and on the sixth of September, 1910, the first sod in connection with the building of the new railway was turned with due ceremony by the minister of railways and canals. Advertisements have been running asking for tenders for the construction of the first 180 miles northward from The Pas. The change of government which resulted from the federal elections of last September will, in all probability, hasten the work of construction, for the Liberal-Conservative party is pledged to build the road. Hence, there seems to be no doubt but that the long-talked-of Hudson Bay Railway will soon be an accomplished fact.

A glance at the railway map of the Dominion issued in 1911 by the Department of the Interior shows that of all the lines in the prairie provinces the Canadian Northern approaches the nearest to Hudson bay. On the Prince Albert branch of this system, at a point nearly 400 miles northwest of Winnipeg, the trains now stop at a place called "Hudson Bay Junction." Upon inquiry it is found that a branch line reaches out northeastwardly for a distance of 86 miles in almost a direct line towards Hudson bay to a point on the south side of the Saskatchewan river known as The Pas. From here to Hudson bay the distance is only 477 miles via the surveyed route to Port Churchill, and but 410 to Port Nelson. The latter follows the course of the former for the first 150 miles or thereabouts from The Pas, so that the work of construction need not be delayed on account of the failure thus far to decide upon the choice of route.

THE PROPOSED ROUTE.

Until recently the country through which the railway will pass was little known, and even at the present time our knowledge of the region is very incomplete. The best available information is contained in the various volumes of the Canadian Geological Survey, and in the two reports of John Armstrong, chief engineer of the Hudson Bay Railway surveys, which were submitted to parliament in 1909. On the whole, the character of the country is such as to permit a comparatively low cost of construction, although in certain places it will necessitate the building of a winding track in order to secure at a moderate cost the easy grades which are provided for in the estimates. There is little reason for believing that the agricultural resources of the country are such as will attract any considerable number of settlers for some time to come—at any rate, not until the more desirable portions of the Canadian West have been filled with immigrants. At present the country is practically unoccupied, for not a single road or farm crossing is to be met with on the projected railway lines throughout the entire distance between The Pas and Hudson bay. Considerable timber is met with on the line to Port Churchill, but probably the Nelson route is the better timbered throughout. It has yet to be shown that the region is rich in minerals. The building of the railway may result in the finding of valuable deposits, as has been the case heretofore in other

*Abstract of an article in the Yale Review for April. Reprinted by permission.

parts of Canada. Hence, although it is always impossible to predict accurately the future of any region, all the available evidence leads to the conclusion that there seems to be no prospect of the railway deriving much income from carrying the products of the immediate country through which it will pass—certainly not for some time to come. The revenue must be obtained largely from the drawing of through trains of grain from the northwest to meet ocean steamers at the terminus on Hudson bay.

One has only to study a map for a few moments to see that the shortest route from the center of the wheat belt to Liverpool is via Hudson bay and strait. There is no need of giving in detail comparative figures of distances, for in this important particular the Hudson bay route has a decided advantage over all others. For all practical purposes the distance by steamship from the railway terminus on Hudson bay to Liverpool will be approximately the same as from Montreal to Liverpool. But the distance by rail to Hudson bay from the wheat fields of the West averages about a thousand miles less than to Montreal, the head of ocean navigation. Hence, the utilization of the Hudson bay route would effect a shortening, on the average, of approximately a thousand miles in the distance from the wheat fields of the West to the seaboard, without increasing the ocean distance to the world's principal markets.

From what has already been said it ought to be evident that there is no question as to the pressing need of opening up this additional outlet for Canadian wheat nor as to the saving in distance that would be effected by its use. The crucial point in the whole project, however, and the one upon which the success or failure of the scheme depends, is the possibility of ocean steamers reaching the railway terminus on Hudson bay for any considerable length of time per year. This is a complex problem, but one upon which a good deal of light has been shed by the investigations of exploring expeditions sent out by the Dominion government, and by the reports of others who have spent considerable time at or in the vicinity of Hudson bay.

Turning now to a consideration of the practicability of navigating Hudson bay and strait for commercial purposes, it should be remembered that their most northern shores are well outside the Arctic circle. Port Churchill is in about the same latitude as the north of Scotland; and Moose Factory, on the southern shore of James bay, is farther south than London. Hudson bay, including the southern projection known as James bay, is a vast area of water which is, roughly speaking, a thousand miles in length from north to south and 600 miles in breadth. Its approximate area is 600,000 sq. miles, or nearly five times that of the British isles, or six times that of the Great Lakes. The only practicable approach to Hudson bay from the Atlantic is through the strait of the same name. This is a deep channel about 500 miles in length, with an average breadth of 100 miles, narrowing down to a minimum with of from 40 to 45 miles. It is remarkably free from rocks and shoals or other obstructions to navigation, while the soundings show the depth of water to vary between 900 and 1,800 ft. It has been stated upon good authority that the bay is always open and as free to navigation as the Atlantic itself. The waters in the harbors, as also those for some distance from the shore line, are frozen for a part of the year; but it is reported that by the use of ice-breakers the harbors may be kept open for the entire winter. Moreover the bay is easy of navigation in that it is unusually free from rocks and shoals, and its depth is remarkably uniform, averaging over 400 ft.

NAVIGATION OF HUDSON BAY.

But fortunate as it is that Hudson bay itself contains no obstacles which would interfere with its use for commercial purposes at any time of the year, it is to be regretted that such a favorable report cannot be made upon Hudson strait; for here we find that nature has imposed a limit to the period of navigation, in the form of ice. Another possible drawback to the easy use of this route is that, no matter whether Port Churchill or Port Nelson be eventually selected as the railway terminus, the harbor will be icebound for a part of the year. There seems to be no serious problem, however, connected with the ice conditions in the harbors, for these remain open in the autumn as long as it is possible for vessels to leave the strait, and are likely to be clear again the following season by the time they are able to enter the bay. Moreover, it is highly probable, as we have already seen, that the harbors can be kept open the whole year. Hence, the question as to how long each season the Hudson bay route could be used for the purposes of commerce is dependent chiefly upon the length of time Hudson strait may be navigated with safety.

As already pointed out, the Dominion government has been untiring in its efforts to arrive at the true answer to this question. In the light of all the evidence collected by experts, it seems fair to conclude that Hudson bay and strait, when properly charted and lighted, will afford a reasonably safe route for commercial vessels for at least three months in the year—from about the middle of July to the latter half of October. This conclusion should be considered as conservative. It is not entirely improbable that the period of safe navigation, so far as it is dependent upon ice conditions, may be lengthened materially when full information regarding the straits is at hand.

VOLUME OF TRAFFIC.

Assuming, then, the practicability of shipping grain from the northwest via Hudson strait, it may be well to inquire what portion of the export crop will probably be handled by this route. It must be admitted frankly at the outset that this question can be answered only in a general way, for there are so many factors which are capable of influencing the choice of route that it is impossible accurately to reckon with them all. So far as distance is concerned, it is evident that there would be a great advantage in shipping by the Hudson bay route. For all practical purposes, The Pas is as near to Port Nelson on Hudson bay as Winnipeg, the great wheat-shipping center in Manitoba, is to Fort William and Port Arthur, the two important grain ports on Lake Superior. But, as it has already been shown, Port Nelson is almost as near to Liverpool as is Montreal; so that the average distance to be saved by shipping via Hudson bay is the distance between Fort William and Montreal—approximately a thousand miles. Let us assume for the moment that it will be as cheap and as easy to provide for the transportation of grain from Port Nelson to Liverpool as it now is to make such shipments over the longer route from Fort William; and that, under any circumstances, grain will be carried as cheaply to Hudson bay as it now is from Winnipeg over the railway lines converging upon Fort William and Port Arthur. Winnipeg and The Pas may then be considered as "radiating points," each of which may be expected to draw upon a considerable area for traffic. Evidently somewhere between these two centers there will be neutral ground from which there would be no choice of route. This whole matter has received attention at the hands of the government officials, and it has been estimated that a line drawn from Dauphin, Manitoba, in a southwesterly direction so as to pass through Weyburn, Saskatchewan, would separate the territories tributary to Winnipeg and The Pas. Such a line of demarcation gives practically the whole of Manitoba and something like 11,000 sq. miles of the southeastern portion of Saskatchewan to Winnipeg, while the rest of Saskatchewan, including by far the greater part of the province, and all of Alberta belong to The Pas. The latter comprises a vast area equal in size to the Dakotas, Minnesota, Wisconsin, Nebraska and Iowa combined, whose fertility is believed to compare favorably with that of the states mentioned. It is the abundant faith in the future of this large region tributary to The Pas which has prompted the government of Canada to hearken to the demands of its western constituents and build the railway to Hudson bay. It is true that the country to the eastward of the line of demarcation is producing the most wheat at present, but already the yield in the area tributary to The Pas

is considerable, and there is no question but that millions of acres more will be sown to wheat within the next two or three decades.

There are, however, as has been intimated, certain indeterminable factors which are likely to upset all calculations and turn the shipment into channels least expected. The Hudson bay route can be used in the autumn for only about two months after the shipment of the year's crop begins; it will be closed for the season a month or more before the last shipments may be made from Fort William. And in the spring the great mass of grain which has been contained in the elevators during the winter cannot be forwarded via Hudson bay for possibly three months after the opening of navigation on the lakes. No one can foretell the ultimate influence of such facts upon the choice of a transportation route. Our assumption that the grain will be landed at Hudson bay as cheaply as at Fort William is a reasonable one, for the distances over which it would move are approximately the same to both points. In spite of the fact that the return traffic from Hudson bay promises to be light, it is expected that the rates on the new road will meet those on the lines which lead eastward. If it be assumed that freight and insurance rates will be equal from Montreal and the Hudson bay terminus of the railway to Liverpool, there will be a saving of from three and one-half to four and one-half cents per bushel in using the Hudson bay route instead of the St. Lawrence. For the cost of carriage from the head of Lake Superior to Montreal in 1910 varied between these two figures.

OPERATION CONSIDERATIONS.

The fact that the railway can be operated to its fullest capacity for only two months, to a somewhat lessened capacity for a third month, and possibly not at all or at any rate only to a small fraction of its capacity for the remaining three-fourths of the year, presents some unusually difficult problems to the engineers. It has been hard to decide upon what basis to provide accommodation for a railway which must be operated with such limitations. According to the plan which had been worked out by the former deputy minister and chief engineer of the Department of Railways and Canals, in the latter part of 1909, it was provided that there should be a single-track road. It was believed that 32 freight trains and one passenger train per day would be its capacity, so that roundhouses and shop accommodation sufficient to handle these numbers would be required.

It was estimated that a road thus equipped, when working to its fullest capacity and allowing for delays and accidents, would carry about 64,000,000 bu. of wheat to Hudson bay per month. There would have to be provided over 100 train crews, 150 telegraph operators, over 50 gangs of section men, shopmen, roundhouse men, superintendents, trainmasters, yardmasters, etc., most of whom would not be required for more than two or three months in the busy season in the autumn. For this reason it may be entirely impracticable for the government itself to operate the road after it has been built. It was stated by the deputy minister that it "would seem to require to be worked by one of the large corporations, so that men and rolling stock could be utilized the whole year." But at the very time that the Hudson Bay Railway would be running to its fullest capacity, both men and rolling stock are most in demand on the lines which operate throughout the year. This is also the time when there is usually a heavy general demand for labor. Then soon after the cessation of wheat shipments northward, the rush season would be over on the regular lines. Undoubtedly, however, some solution of the problem will be found. It is possible that the building of the road will soon be followed by the settlement of the adjacent country, and that a growing local traffic will make it necessary to operate the road the year round. This is a glimmering hope of the many, although it is actually expected only by the more optimistic.

Those who look with little favor upon the whole project find no end of prospective troubles. Yet it is to be remembered that there are few railways which have not been built in the face of what seemed to many at first sight to be insurmountable difficulties. This is true of a number of the Canadian lines. When the Canadian Pacific Railway was projected, it was predicted by a number of the leading men in the Canadian parliament that the road never would earn grease for its car wheels; and yet it is now one of the most prosperous railway companies in the world. There is absolutely no way of foretelling with accuracy the results which will follow a new line, especially when it traverses a new and comparatively unknown region. It is to be hoped that the building of the Hudson Bay Railway will hasten the development of the Canadian northwest; that the country through which it will pass may prove to be, when better known, of far greater economic value than the present available data would warrant us in believing; and that the various difficulties which now present themselves respecting the safe shipment of grain from the Hudson bay terminal may prove in time to have been more imaginary than real.

TRAIN ACCIDENTS IN MARCH[1]

Following is a list of the most notable train accidents that occurred on railways of the United States in the month of March, 1912.

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd.	Inj'd.
†*8.	Georgia	Social Circle.	bc.	P. & F.	5	9
8.	Atlantic C. L.	Wilmington.	bc.	P. & F.	4	9
*12.	N. Y. C.	Macedon.	rc.	F. & F.	1	0
12.	C., C., C. & St. L.	Greencastle.	bc.	P. & F.	3	18
13.	N. Y. C.: L. V.	Canastota.	xc.	F. & F.	1	3
13.	A., T. & S. F.	McCarty's.	rc.	F. & F.	3	8
15.	N. Y. C.	Syracuse.	xc.	F. & F.	1	0
†*20.	Ill. Cent.	Charles City, Ia.	rc.	F. & F.	1	0
20.	Lehigh Val.	Manchester.	xc	F. & F.	1	0
21.	Penn.	Barnegat.	bc.	P. & F.	2	10
29.	M., K. & T.	Denison.	bc.	F. & F.	0	8

Derailments.

Date.	Road.	Place.	Cause of Derailm't.	Kind of Train.	Kil'd.	Inj'd.
†1.	Southern	Oxford.	d. eq.	P.	5	5
4.	Denver & R. G.	Salida.	unx.	P.	1	1
4.	Penn.	Bucyrus.	b. wheel.	P.	0	0
6.	Ga., S. & F.	Tifton.	d. track.	P.	0	12
7.	Cleve., C., C. & St. L.	Bellefontaine.	acc. obst.	P.	0	2
7.	L. S. & M. S.	Collinwood.	b. wheel.	P.	1	3
†7.	Wabash	W. Lebanon.	b. rail.	P.	4	81
12.	Chi., M. & St. P.	Oakwood.	d. rail.	P.	0	15
12.	N. Y. C.	Batavia.	b. wheel.	P.	0	5
13.	N. Y. C.	Hyde Park.	b. rail.	P.	0	16
14.	Chicago G. W.	Dunkerton.	b. rail.	P.	0	28
22.	Cin., H. & D.	Miamisburg.	d. track.	P.	0	1
23.	Chi., B. & Q.	Cosby, Mo.	d. track.	P	0	7
31.	St. Louis, I. M. & S.	Wagoner.	.....	P.	1	23

The collision near Social Circle, Ga., on the 8th, occurred at 2:15 a. m., and four of the persons killed were negro passengers riding in the second class car. Eastbound passenger train No. 4 collided with westbound freight No. 13A, wrecking both engines, the first 3 cars on the passenger train and two cars of the freight. The investigation resulted in the conclusion that the engineman of the freight mis-read his watch, believing that when he departed from Rutledge, the first station east of the place of collision, he had sufficient time to go to a station twelve miles distant to meet No. 4. The conductor of this train alleges that his watch was wrong, although it had been compared with the regulator twelve hours previous, with a variation of less than five seconds. The conductor of No. 13B, which train was standing

[1]Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

in the siding at Rutledge when Section A left there, immediately inquired over the telephone of the despatcher if 13A had orders giving it the right of road to the next station and informed the despatcher of the departure of Section A. The despatcher promptly notified the next station west, but too late, as No. 4 had left.

The trains in collision at Wilmington, N. C., on the 8th, were a passenger train from Fayetteville and an engine without train which had just started from the station to go to the relief of a disabled passenger train. The persons killed were the foreman of the company's shops, H. B. Goodknight and the engineman and fireman of the passenger train. Seven passengers and two employees were injured. The men in charge of the relief engine had overlooked the schedule of the passenger train.

The collision at Macedon, N. Y., on the 12th, occurred at 2 a. m.; an eastbound freight ran past a fixed signal set against it and into a preceding freight, which had been unexpectedly stopped, wrecking the caboose and one car. The caboose took fire from its stove and the conductor was burned to death.

The trains in collision at Greencastle, Ind., on the 13th, were the eastbound 24-hour train running from St. Louis to New York and a westbound freight which was at a standstill at the station. Of the persons killed one was the engineman of the freight, one was a man stealing a ride on the freight, and the third was the engineman of the passenger train. Thirteen passengers, three employees and two trespassers were injured.

The freight had encroached on the time of the passenger train without right. It appears that the line at this point is double track and the freight had used the eastbound track from Delmar, the first station east of Greencastle. It had right only to Greencastle and should have entered the side track at the east switch, but this was not done. The engineman of the freight was killed. The conductor of the freight is also held responsible, as the train had been at rest about 15 minutes before the collision occurred. The manual block system is in use here also, but it appears that the signalman reported to the despatcher that the freight was clear of the main track when it was not. The signalman appears to have taken the word of a brakeman of the freight.

In the collision at Canastota, N. Y., on the 13th a freight of the New York Central struck an engine of the Lehigh Valley at the crossing of the two roads, the New York Central engine being overturned and ditched. The person killed was a trespasser. The freight had passed distant and home signals set against it.

In the collision at McCarty's, N. M., on the 13th, a westbound freight train rain into a work train. The engine and the caboose of the work train were wrecked. The persons killed and injured were in the caboose of the work train; the track foreman, his wife and an assistant track foreman, killed, and five employees and three children of the track foreman injured. The cause of the collision was failure of work train to properly protect by flag.

The collision at Syracuse, N. Y., on the 15th, was between two engines in the yard, and the person killed was an employee riding on the front end of one of the engines. There was a dense fog at the time.

The rear collision of freight trains on the Illinois Central at Charles City, Iowa, on the 20th, resulted in the wrecking of the caboose of the leading train; and a trespasser riding in a car was burned to death by fire which started from the caboose stove. The following train had entered the yard at uncontrollable speed.

In the collision at Manchester, N. Y., on the 20th, a yard engine struck some freight cars on the main track. The engine was running at about 10 or 12 miles an hour, and an explosion of chemicals occurred in one of the cars, burning this car, as well as several others in the immediate vicinity. A freight conductor, riding on the front of the engine, was fatally injured.

The butting collision at Barnegat Pier, N. J., on the 21st, which occurred at about 6 p. m., was between an eastbound passenger train and a westbound freight standing on a side track. The switch had been left set for the side track, and the passenger train, approaching the station at uncontrollable speed, ran over the switch and into the head of the freight, wrecking both engines, one baggage car and three freight cars. The persons killed were the fireman of the passenger and the fireman of the freight; and six passengers and four trainmen were injured.

The train derailed at Oxford, Ala., on the 1st, was westbound passenger train No. 35, and three of the five persons killed were passengers, two of them being scalded by steam from a freight locomotive standing on an adjacent track, the car in which these passengers were riding having run against the engine in such a way as to cause the rupture of some of its steam pipes. One passenger car and one baggage car were overturned. The cause of the derailment was a part of the brake rigging which had broken and fallen on the track.

The train derailed near Salida, Colo., on the 4th was the westbound Continental Limited No. 3, and the two engines drawing the train were overturned. The person killed was the fireman. One of the enginemen was fatally injured. The derailment was due to an insecure rail; insecure apparently because repairmen had left it insufficiently spiked.

The train derailed at Bucyrus, Ohio, on the 4th, was the westbound 18-hour train, New York to Chicago. The derailment was due to the breaking of a wheel of the tender of the second engine.

The train derailed at Bellefontaine, Ohio, on the 7th, was eastbound express No. 20. It ran into a freight car which had been derailed on a sidetrack and overturned so as to foul the main track a few seconds before the passenger train came along. The passenger engine was overturned and fell down a bank, but the engineman and fireman, in some unaccountable way, escaped with only trifling injuries. No other person was injured, as the engine cleared the main track and allowed the rest of the train to run along some little distance before it came to a stop.

The train derailed at Collinwood, Ohio, on the 7th, was the westbound Twentieth Century Limited, and the cause of the derailment was a broken wheel. The person killed was a watchman in the cabin near the track, which was struck and demolished by the train. Sixteen passengers and three trainmen were injured.

The train derailed at West Lebanon, Ind., on the 7th, was the westbound Continental Limited, and all of the passenger cars were overturned or partly overturned in the ditch. The mail car, which was of steel, fell down a bank and was turned over one complete revolution, but the five clerks in the car escaped with only trifling injuries. Three passengers and one employee were killed and 62 passengers, 11 employees and 8 other persons were injured. (Reported March 15, p. 508.)

The train derailed at Batavia, N. Y., on the 12th, was eastbound passenger train No. 20, and one passenger car was overturned so that it fell against a train standing on an adjacent track. Five passengers were injured, none seriously. The train was automatically stopped by the air brakes, the air pipe having been broken. The derailment occurred at a frog, and was due to the breaking of a wheel of a sleeping car.

The train derailed at Hyde Park, N. Y., on the 13th, was the eastbound Twentieth Century Limited, of which all the cars but one fell to the Hudson river, which, however, was covered with ice. This accident was reported in the *Railway Age Gazette* March 15. It is believed to have been caused by a broken rail. The engine and the leading truck of the first car passed over safely.

The derailment at Dunkerton, Iowa, on the 14th, occurred at 2:30 a. m., and it was due to a broken rail. The train was running at about 40 miles an hour. Three day cars and one sleeping car were ditched and 28 persons were injured, one of them fatally.

The train derailed at Cosby, Mo., on the 23d, was northbound

passenger train No. 113. It was running at low speed near the station and was thrown off the track at a derailing switch which was out of order because of softness of the roadbed due to heavy rains. The baggage car and two passenger cars were overturned and fell down a bank. Seven persons were injured.

The train derailed near Wagoner, Okla., on the 31st, was St. Louis & San Francisco passenger train No. 3. Forty-six passengers and 7 employees were injured, none of them very seriously. The train was being run over the Iron Mountain because of an obstruction on the St. L. & S. F. The tender was the first vehicle to leave the track. The track was soft and a speed limit of 30 miles an hour was in force. This may have been exceeded.

Canada.—Two serious collisions occurred on the Canadian Pacific in March, one at Hull, Ont., on the 8th, and one at Amyot, Ont., on the 23rd. At Hull four passengers and the conductor were killed and 11 persons were injured. In the other case one passenger and two trainmen were killed and three persons were injured. In this case, it is said, that the passenger train, westbound, ran past the station at which it was ordered to meet the eastbound freight. At Hull a telegrapher is held at fault. A coroner's jury found that the passenger train was running with the engine at the rear and that the mortality would have been less if it had been at the head of its train.

Electric Accidents.—Of the eight accidents to electric cars reported in the newspapers as having occurred in the United States in the month of March, three resulted in fatal injuries; a collision at Victor, N. Y., on the 8th, one at Brown's, Ohio, on the 22nd, and one at Fortville, Ind., on the same day, two persons being killed in the last named accident. At Victor, a work train backed into a passenger car, the view of which was obscured by fog. At Brown's a freight car ran around a sharp curve and into a standing passenger car. At Fortville, two passenger cars met in a butting collision, both running at good speed. The vestibules of both were crushed and the motormen were instantly killed. The wreck was set on fire by short circuits in the wires and by the overturned heaters. The first relief for the 30 persons injured in this wreck came in the shape of a freight train of the Cleveland, Cincinnati, Chicago & St. Louis, the conductor of which took the injured persons into his caboose and carried them to Indianapolis.

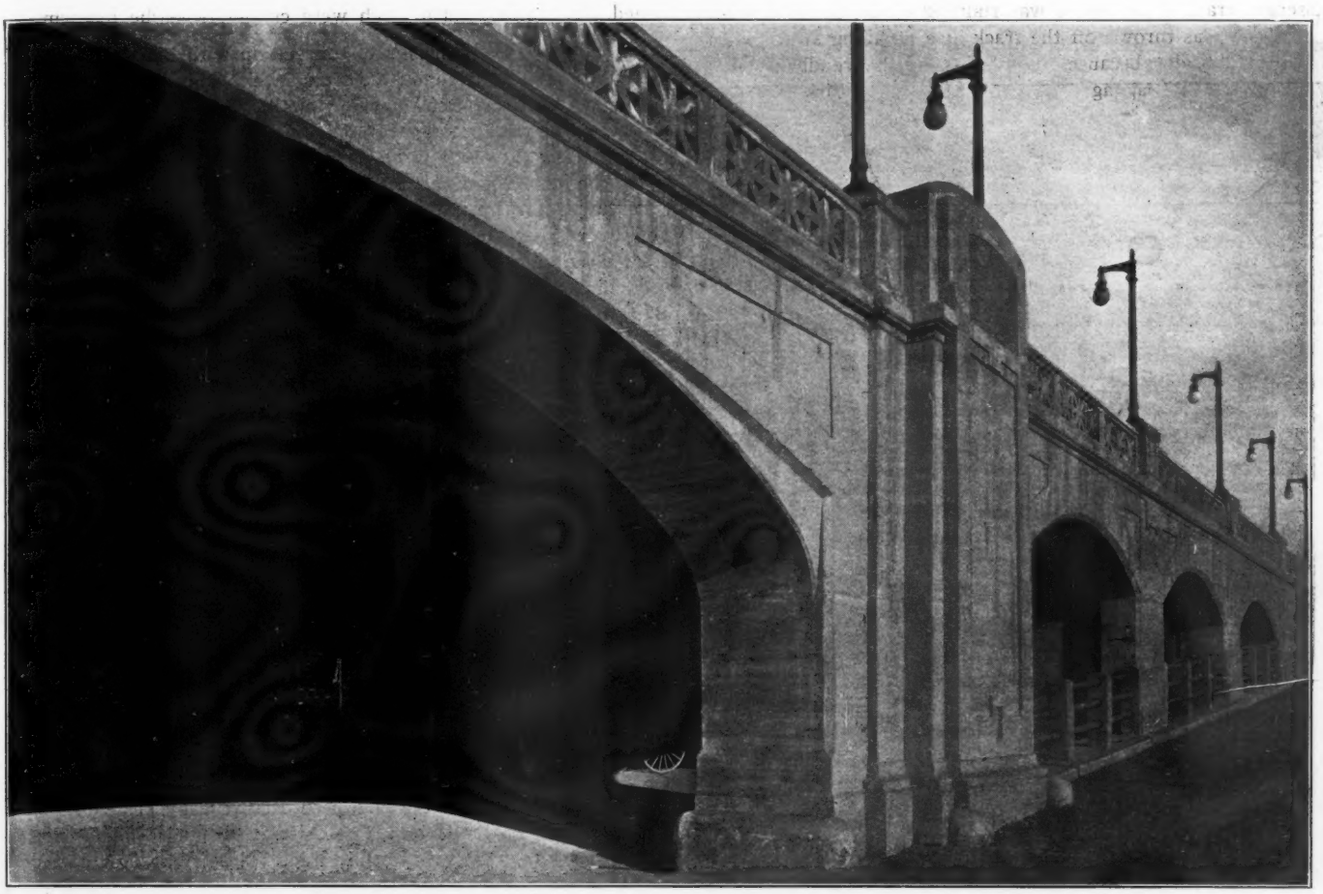
NEW NORTHERN CENTRAL STATION AT BALTIMORE.

The new Northern Central union station at Baltimore, Md., was put in service last fall, but not fully completed until this winter. Previous descriptions have appeared in the *Railway Age Gazette* of April 8, 1910, and January 13, 1911.

The new building is on the site of the old union passenger station between St. Paul street and Charles street, and just north of Jones falls. The station fronts south, toward the center of the city, the seven passenger tracks being at the back. The building, as shown in the photograph, is reached from Charles street by an approach bridge over the main freight tracks, several spur tracks and over Jones falls. A bridge 50 ft. wide connects Charles street and St. Paul street. There is a street car line on Charles street, but none on St. Paul street.

General View of Baltimore Station, from St. Paul Street.

The concourse is at street level. There is an enclosed concourse parallel to the tracks with a covered passage leading past the cab stand to Charles street. The rest of the concourse is on a bridge over the tracks. Incoming and outgoing passengers are not mechanically separated, but their movements are unrestricted, since incoming passengers diverge through the enclosed concourse toward Charles street, while outbound passengers go from the main waiting room direct to the head of the stairs leading to the platform on which their train stands. The



Entrance to Baggage and Express Rooms at Foot of Ramp.

Main Waiting Room.

tracks are protected with Bush train sheds, several installations of which have been described in these columns.

Faience Drinking Fountain in Concourse.

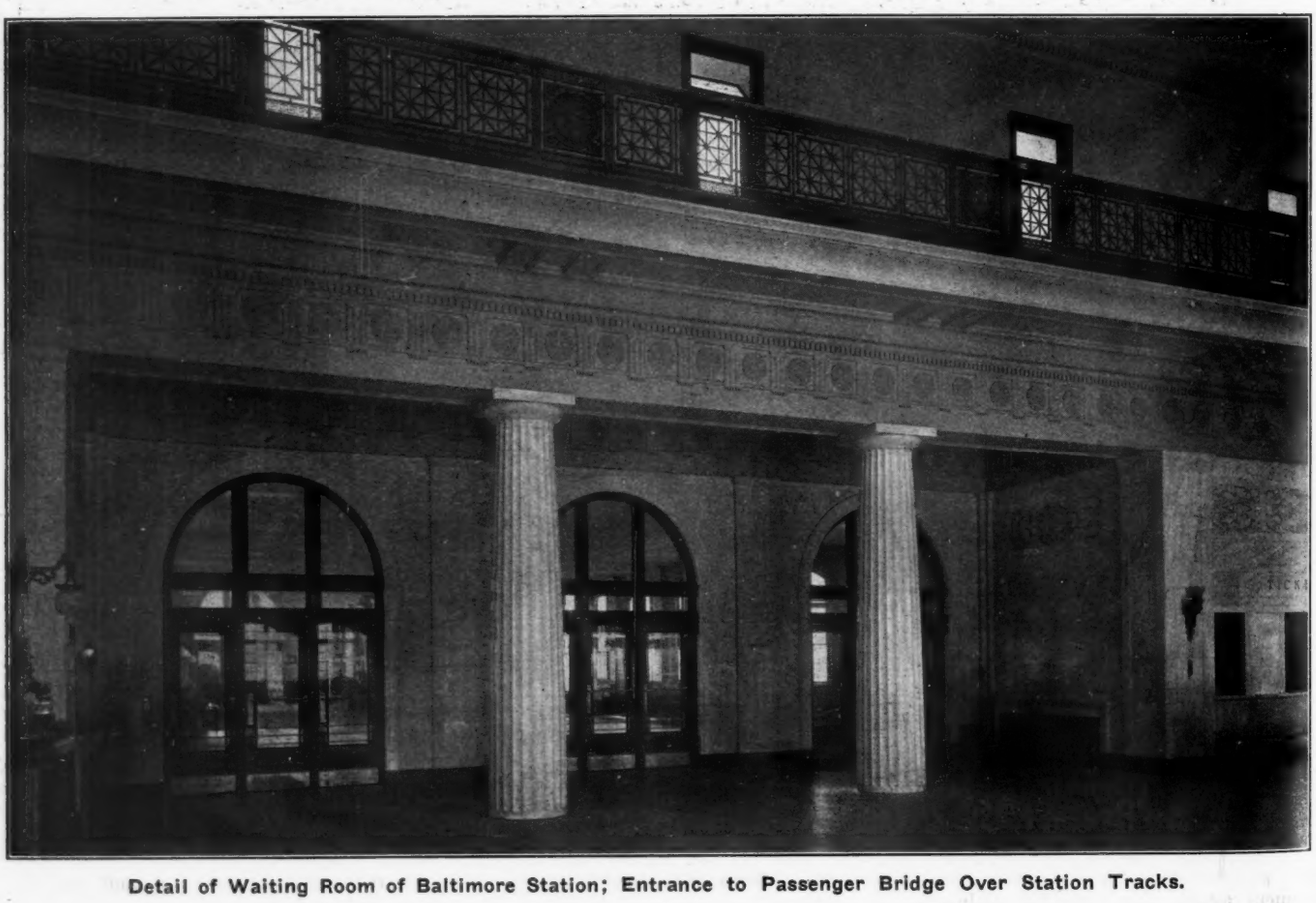
The baggage room at the street level is used only for luggage which the passenger brings to the station with him. The main baggage room is below on the track level. This level is reached by an inclined driveway opening on St. Paul street just south of the bridge connecting the two streets. A baggage chute and an elevator also connect the baggage room on the street level with the large room at track level. There are no subways under the tracks for handling baggage to the platforms; baggage is trucked across the tracks. The other rooms on the track level of the building include express room, immigrants' waiting room, commissary department rooms, trainmasters' office, station master's office.

The two upper floors of the building are for offices. The main waiting room is three stories high, being covered by a skylight. The building is fireproof, steel and concrete construction. The exterior is finished in pink Milford granite. The interior of the waiting room is of Doric architecture and is finished in Pentellic marble, the same stone of which the Parthenon at Athens is made. The concourse on the bridge over the tracks is lined with Faience tiling, and all rooms in the basement are also tiled.

Kenneth M. Murchison, New York, was the architect.

An extension of the Siamese Northern line, Siam, from Dene Chai to Chiengmai, is proposed. This line would run from Dene Chai via Pang Buei across the Meh Yome and the Meh Wang rivers, and thence to the plain of Chiengmai through a tunnel nearly a mile long. From Bangkok to Chiengmai the distance by this route is 453 miles, and from Dene Chai 135 miles.

The first section of the Southern Railway, Federated Malay States, from Perchaburi to Cha Alm, a distance of 23 miles, was opened to traffic on June 1, 1911. This is the first part of the new railway which will eventually link the Siamese and the Federated Malay State railway systems and form a direct connection beyond Singapore and Bangkok. This connection is expected to be completed within two years.



Detail of Waiting Room of Baltimore Station; Entrance to Passenger Bridge Over Station Tracks.

General News Section.

The general offices of the Chicago, Indianapolis & Louisville in Chicago, now located in the Republic building, will be removed about May 1 to the Heisen building, where a lease has been taken of the entire fourteenth floor.

The Grand Trunk has signed an agreement with its locomotive enginemen, to be in force three years, by which wages will be increased about 10 per cent. The increase applies on the whole of the company's lines, both in Canada and the United States.

The railway brotherhoods which have been asking for increased pay on the lines of the southeastern states, are now voting on the question of giving their leaders power to order a strike, and the vote may be announced in a week or ten days.

Two masked robbers secured an entrance to the Golden State Limited train on the Chicago, Rock Island & Pacific near Rock Island, Ill., on April 21, and robbed seven passengers in one of the sleeping cars of their money and valuables. The men entered the train after it had stopped to take water.

The Western Union Telegraph Company announces that it has made a contract with the Marconi Wireless Telegraph Company for the general interchange of messages to and from Europe; and the contract provides for the extension of the wireless telegraph from the Pacific coast to Hawaii, China, Japan and the Philippines.

The twenty-third annual report of the Relief Department of the Chicago, Burlington & Quincy, for the year ending December 31, 1911, shows an expenditure during the year of $621,165.34 in benefit orders to employees of the company. This was more than was received in contributions from members, and the company advanced $38,262.76. Since the establishment of the fund in 1889 there has been paid in benefit orders to employees on account of sickness and accidents a total of $8,240,184.67. The payments by the railway company have amounted to $1,458,211.

The New York State Public Service Commission, Second district, announces that it is unable to take up any further grade crossing elimination applications this year as no funds have been provided for the state's proportion of such work. There are now uncompleted 41 cases in which work has been ordered. The total estimated amount of the state's proportion of the cost in those cases is $1,137,258. The entire balance of appropriations available for every purpose is $1,209,513. There are pending before the commission twenty-seven applications on which no action can be taken at present.

Governor Dix, of New York, has approved the bill which has been passed by the legislature codifying the law, relating to lands and forests. The reforestation of waste land is to be encouraged by relieving the owners from taxation. Inspectors, acting for the state, are to inspect railway locomotives anywhere in the state where large forests are liable to be endangered by engines which throw sparks, and an inspector may order out of service an engine not suitably equipped to guard against fires. The rules in regard to locomotives apply to logging roads as well as lines operated by common carriers.

The Special Committee on the Relations of Railway Operation to Legislation has prepared a brief memorial to F. O. Melcher, the late chairman of the committee, who was killed in the collision at Kinmundy, Ill., January 22, and has sent copies of it to all the railways. This memorial, signed by Chairman Jackson and Messrs. Stuart and Wickersham, recognizes Mr. Melcher's particularly valuable work as chairman of the committee, and closes with the declaration that "we record our conviction that of all the men of his time he has contributed most largely to the ultimate working out of a proper relationship between the railways, the public, the government and railway employees."

A press despatch from Denver says that the Denver & Rio Grande has deeded back to the government coal land in Colorado and Utah worth $2,000,000, which was secured by the use of "dummy" entrymen. The suit of the government to recover has been compromised and 8,288 acres of coal lands revert to the United States. The royalty for which judgment was asked at 8 cents a ton is the equivalent of $15,000,000. The suit has been pending for about four years. It was brought by the government against the Utah and Calumet Coal companies which are controlled by the Denver & Rio Grande. They were charged with making fraudulent land filings in which dummy entrymen were said to have figured.

Vice-president W. L. Park of the Illinois Central has written a letter to Captain Beech, in charge of the Illinois Central's transfer boat "Bertram," plying between Helena, Ark., and Trotter's Point, Miss., commending his heroism during the floods in the Mississippi river. Without special instructions, after he had been cut off from the Mississippi side he took his boat along the levee on the Arkansas side and at great risk to himself and crew saved a great many lives and personal property. Mr. Park said in his letter: "Seed sown in this way must return a hundred fold in bringing about on the part of the public greater confidence in and respect for the railways, which they have in most cases been unjustly deprived of."

A new contract has been entered into by the Illinois Central and the Board of South Park Commissioners of Chicago, by which the railway surrenders to the commission its riparian rights to the shore of Lake Michigan in return for a strip of additional right of way from 50 ft. to 150 ft. wide from Thirty-first to Fifty-first street, and additional property south of Twelfth street; and the railway agrees to depress its tracks 7 ft. between Thirty-first and Fifty-first street. The new contract omits several features included in the previous contract, which the city council refused to approve, and can be carried out without the consent of the city. Several other features of the plan, including the opening of Twelfth street, through the railway property and the location of the proposed new passenger terminal, are left for further negotiations between the city and the railway.

Two hundred and fifty delegates, representing the Brotherhood of Railway Car Men, the Brotherhood of Boilermakers and Helpers, the Brotherhood of Blacksmiths, the International Association of Sheet Metal Workers, and other shopmen's organizations, at a meeting at Kansas City on April 22, organized the "Federation of Federations," to represent the shop workmen employed on 47 lines west of the Mississippi river. The Federation claims 300,000 members. On the second day of their meeting they prepared and sent to President Taft a telegram notifying him that they had decided "to extend or to make preparation to extend" to all the railways in the West the strike on the Harriman Lines and the Illinois Central, which they started last year, "unless a settlement of an honorable character can be secured." They claim that their constituents are determined and that the other railways are assisting the Harriman Lines; and it is declared that boiler explosions are becoming more frequent. The president of the Federation of Federations is W. O. Horton, of St. Louis; vice-president, G. W. Pring, Des Moines; secretary, John Scott, San Francisco. The first of the eleven names signed to the telegram sent to President Taft is James W. Kline.

Governor Wilson, of New Jersey, has sent to the legislature a veto of the law requiring abolition of grade crossings which was passed by the legislature several weeks ago. This bill provided for the abolition of dangerous grade crossings under the supervision of the Public Utility Commission, the commission being empowered to decide details, settle differences and determine the order in which rival applications shall be attended to. If a railway asked to have a crossing abolished, it would have to pay the whole cost, including property damages, except that an electric street railway could be compelled to pay 10 per cent. When a city or town petitioned the commission, it would have to pay 15 per cent. of the expense. The most sweeping provision was that every railway in the state should remove one crossing every year for each 30 miles of its line. Some of those who advocated this bill claim that it is a law, in spite of the governor's action, because he sent his veto to the wrong House. Both houses of the legislature discussed the bill on the last day of the session (April 16), the senate refusing to pass it over the governor's veto, while the house adopted a resolution expressing the belief that the bill was already a law. It is expected that it will be filed with the Secretary of State, and that its validity will have to be settled by the courts.

Massachusetts Railways' Appeal to the Public.

The following argument, which explains itself, has been published in the advertising columns of prominent Massachusetts newspapers, set in display type, filling perhaps four times the space which it occupies here. It is signed by T. E. Byrnes, vice-president of the New York, New Haven & Hartford and the Boston & Maine, and J. H. Hustis, vice-president of the New York Central, lessee of the Boston & Albany. It is headed "TO THE PUBLIC":

The "full crew" bill, so-called, which will require the railroads to employ an unnecessary brakeman on many freight trains, is being pushed through the legislature with all the power of the organized trainmen. This bill will cost the railroads approximately $500,000.00 per annum, and if extended to the entire New England Railroad system, will cost over $1,000,000.00 per annum. The railroad commission, in a report dated September 23, 1908, has decided that this extra brakeman is not needed for the safety or convenience of the public or for the safety of the employees themselves.

At present such a number of brakemen is employed as the railroad officials, with the approval of the railroad commission, deem sufficient. No accident has ever taken place which can be fairly attributed to the absence of an extra brakeman, or which would have been averted by the presence of an extra brakeman. Automatic couplers, automatic brakes and block signals introduced by the railroads, at the cost of many millions of dollars, have changed the duties of freight brakemen materially in the last ten years since this bill was first introduced. If the railroads are compelled, against the judgment of their officials and of the railroad commission, to employ unnecessary men, the public must expect to pay the bill in increased rates. There is no other source of income. The public expects electrification, tunnels, improvements in service and equipment, at a cost of scores of millions of dollars. Is it willing to pay for unnecessary freight brakemen, whose employment organized railroad employees alone demand?

If this bill is passed this year, what will prevent another bill being introduced next year commanding the employment of extra engineers, firemen, station men, conductors, ticket takers, section men or motor men? Where is this to stop?

Does the public, who, in the end, must pay the bill, desire that the railroads employ unnecessary labor and that improvements for the general good be halted? We do not believe so, and we ask you to advise your representatives and senators accordingly.

Steel Directors' Interests.

The Congressional committee that has been investigating the steel industry reports that twenty-three officers and directors of the United States Steel Corporation are also directors of organizations representing $35,124,143,009. The report asserts that a great majority of railway corporations, a system of powerful banks and trust companies, and the great insurance companies are allied with the steel corporation. Commercial organizations of which the directors and officers are also directors and officers, represent $17,755,171,249. Railways of which United States steel men are directors represent $10,365,872,344, or more than half the valuation of all the roads in the country. Banks, trust companies and insurance companies, of which these men are directors, have surpluses and deposits of $3,314,811,178; and industrial corporations, $2,813,509,348. Officers of the corporation are also directors in street railways, express companies, telephone companies and steamship companies, with capital and funded indebtedness of $1,171,778,890. The report contends that the United States Steel Corporation with its ramifications of interlocking directorates, constitutes the real "money trust." Of the two great financial groups, the committee is of the opinion that the Morgan group is more powerful than the Standard Oil group.

Negotiations with Eastern Enginemen.

The managers and enginemen of the eastern roads this week accepted offers of mediation under the Erdman act and are now holding separate conferences with the mediators.

On April 18, the committee of managers, who had been considering the announcement of the enginemen's strike vote, sent their reply, to the effect that they had nothing to offer. Grand Chief Stone answered, saying in part: "We desire to call your attention to the fact that the railway companies in the West, Northwest and Southwest and Southeast are at the present time paying their enginemen approximately the same rates we are contending for here, with better working conditions than we are asking for. You base your refusal to grant the increases 'on the roads' inability to pay more,' and offer nothing beyond the bare statement to substantiate it, regardless of the fact that financial reports show both increased earnings and volume of business. You state 'The public interests are demanding safer and better transportation, double track, interlocking and block signals, better cars, stronger track, elimination of grade crossings and adoption of safety appliances.' We agree the public are entitled to all this, and we are firmly of the opinion our constituency composed of 28,000 trained enginemen on the roads represented are an important factor in the creation of that degree of safety so essential to satisfy public demands. We also desire to call your attention to the fact that in both the western and southern territory, where the volume of both freight and passenger traffic is lighter, and grade lines often heavier, the roads are making all these improvements mentioned, and are still earning money, and paying better wages than we request. We note your reference to the conservatism of the enginemen, and wish to suggest we have not departed from that policy, but when the conference committee seeks to capitalize on the conservatism of the enginemen to the extent of declining our proposal in its entirety, such action forces us to admit the futility of adhering to a policy that is unable to secure results that have heretofore been obtained by other employees with more radical policies."

The managers agreed to meet again on April 22 to consider the matter further. They did so, but after the meeting announced that they saw no way of modifying their previous conclusions. The representatives of the brotherhood then announced their intention of putting a strike into effect as soon as possible, probably within 36 hours. That evening Martin A. Knapp, presiding judge of the United States Commerce Court, and Charles P. Neill, United States commissioner of labor, on their own initative offered their services as mediators. The enginemen accepted within a short time, and the following day, after several meetings, the managers also accepted. The mediators held conferences with the latter on April 24 and 25, and intend to meet with the enginemen as soon as possible.

The Mexican Way of Handling a Strike.

Anticipating a strike of the American conductors and enginemen employed on the National Railways of Mexico, which had been called for 5 o'clock on the afternoon of April 17, on account of an alleged policy of discrimination against American employees in order to eliminate them from the service, the management issued an order discharging them at 3 o'clock on the afternoon of the 16th, just 26 hours in advance of the time set for the strike. According to press reports, the order found many of the men at distant points on the system; and, four days before, an order had been issued cancelling all passes for American employees and members of their families. About 1,000 American enginemen and conductors are said to have been affected. All trains run after the issuance of the order were manned entirely by Mexicans, but for a time it was necessary to abandon a part of the service.

Frisco Asks Governors to Co-operate in Reducing Trespassing.

W. B. Spaulding, chairman of the Central Safety Committee of the St. Louis & San Francisco, has addressed a letter to the governors of the eight states through which the Frisco lines run, Missouri, Kansas, Oklahoma, Arkansas, Texas, Tennessee, Mississippi and Alabama, calling their attention to the proportion of trespassers in the number of persons killed and injured by the railways, and urging their co-operation in improving the situation. With the letter was included a statement showing that 50,025 trespassers were killed and 52,427 injured in the United States during the ten years of 1901-1910 inclusive, while in the same period in Great Britain and Ireland only 4,435 trespassers were killed and 1,319 injured; that of the 103,452 trespassers killed and injured in the last ten years, 13,000 were under the age of 14 years and 20,000 were between the ages of 14 and 21. In other words there have been enough minors killed and injured in the past ten years in the United States to more than make a milepost for every mile traveled in a trip around the world. The letter was as follows:

"The 23,000 employees of the St. Louis & San Francisco, in

an earnest endeavor to safeguard both themselves and the patrons of the company, have established a Safety First, or an accident prevention, organization. This organization, which is represented in all departments, is for the purpose of reducing casualties of every character in the operation of the railway on which they are employed. I have the honor of being its chairman. "I respectfully submit a statement herewith, showing the number of persons, classed under the general head of trespassers, killed and injured on the railways of the United States during the years 1901 to 1910 inclusive, and compared with statistics for Great Britain, and feel confident that you will be impressed with the necessity for measures which will prevent this tremendous decimation in the population, and particularly in the youth of the country.

"The railways of the United States have always realized the importance of this matter and have continuously attempted to prevent this peculiarly unnecessary loss of life. The annual uniformity of the fatalities among the trespasser class discloses the futility of the efforts of the railways in this direction.

"In its essence, this is an economic question for which England and Germany have long since made provision. Governmental aid is necessary to remedy this public evil. Primarily, we need your co-operation and trust you will accord us your valuable energetic assistance.

"I hope you will find it consistent to send us a letter, a copy of which we can send to every mayor and county judge in the state, in order to impress upon them the need of stringent action in dealing with railway trespassers, and at the same time, I request your attention to the laws of your state upon the subject, and would suggest that if you deem proper and these laws appear to you inadequate, that you bring the subject to the attention of your next general assembly.

"If, however, you find the laws adequate, we earnestly solicit your assistance in seeing that they are effectively enforced."

Mr. Spaulding has received replies from Governor Earl Brewer of Mississippi and from Governor Colquitt of Texas, promising their co-operation. Governor Brewer said he would bring the matter to the attention of the next legislature, and Governor Colquitt expresses the opinion that the municipal authorities should pass ordinances prohibiting trespassing.

Cleveland Engineering Society.

At the regular meeting of the Cleveland Engineering Society to be held May 14, Colonel John Millis, U. S. A., will give an illustrated talk on River and Harbor Improvement, from the engineering standpoint, and Charles W. Hopkinson will give an illustrated talk on the same subject from the esthetic standpoint.

Railway Club of Pittsburgh.

The Railway Club of Pittsburgh will give a minstrel vaudeville entertainment at the Nixon theatre, Pittsburgh, Pa., on May 18.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.; annual, May 7-10, Richmond, Va.

American Association of Demurrage Officers.—A. G. Thomason, Boston, Mass.; annual, May 10-11, San Francisco, Cal.

American Association of General Passenger and Ticket Agents.—W. C. Hope, New York; next convention, Seattle, Wash.

American Association of Freight Agents.—R. O. Wells, East St. Louis, Ill.; annual, June 18-21, Detroit, Mich.

American Association of Railroad Superintendents.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.

American Electric Railway Association.—H. C. Donecker, 29 W. 39th St., New York. Convention, October 7-11, Chicago.

American Electrical Railway Manufacturers' Assoc.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

American Railway Association.—W. F. Allen, 75 Church St., New York. Next session, May 15, New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Convention, 3d week in Oct., Baltimore, Md.

American Railway Engineering Association.—E. H. Fritch, Monadnock Block, Chicago.

American Railway Master Mechanics' Assoc.—J. W. Taylor, Old Colony building, Chicago. Convention, June 17-19, Atlantic City, N. J.

American Railway Tool Foremen's Association.—M. H. Bray, N. Y. N. H. & H., New Haven, Conn. Convention, July 9, Chicago.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

American Society of Engineering Contractors.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

American Wood Preservers' Association.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.

Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.

Association of Railway Claim Agents.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 21-23, 1912, Los Angeles, Cal.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual, June 11, Atlantic City, N. J.; annual, October 21-25, Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.

Association of Transportation and Car Accounting Officers.—G. P. Conrad, 75 Church St., New York. Convention, Oct. 7-11, Chicago.

Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

Canadian Society of Civil Engineers.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

Civil Engineers' Society of St. Paul.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Richmond, Va.; annual, May 15, Buffalo, N. Y.

General Superintendents' Association of Chicago.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

International Railway Congress.—Executive Committee, 11, rue de Louvain, Brussels, Belgium; convention, 1915, Berlin.

International Railway Fuel Association.—D. B. Sebastian, La Salle St. Station, Chicago. Convention, May 22-25, Chicago.

International Railway General Foremen's Association.—L. H. Bryan, Brown Marx building, Birmingham, Ala. Convention, July 23-26, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Convention, August 15, Chicago.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York; annual convention, May 14-17, Pittsburgh, Pa.

Master Car Builders' Association.—J. W. Taylor, Old Colony building, Chicago. Annual convention, June 12-14, Atlantic City, N. J.

Master Car and Locomotive Painters' Assoc. of U. S. and Canada.—A. P. Dane, B. & M., Reading, Mass. Convention, September 10-13, Denver, Col.

National Railway Appliances Assoc.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

New England Railroad Club.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

Northern Railroad Club.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

Omaha Railway Club.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 2 Rector St., New York.

Railway Club of Pittsburgh.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.; next meeting, August 13-16, Roanoke, Va.

Railway Industrial Association.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa.

Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio. Convention, May 20-22, Buffalo, N. Y.

Railway Supply Manufacturers' Assoc.—J. D. Conway, 2135 Oliver Bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. assocs.

Railway Tel. & Tel. Appliance Assoc.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

Richmond Railroad Club.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. September 10-13, Buffalo, N. Y.

St. Louis Railway Club.—B. W. Fraumenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

Signal Appliance Association.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—C. Nyquist, La Salle St. Station, Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

Toledo Transportation Club.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

Traffic Club of Chicago.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

Train Despatchers' Association of America.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.

Transportation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transportation Club of Detroit.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; August, 1912.

Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The first steamboats of the season on Lake Erie started from Buffalo on Monday last.

The Chicago & North Western has established a new parlor car service between Chicago and Williams Bay, Wis.

The Canadian Pacific and the Trans-Siberian Railways have made a joint agreement to sell tickets for trips around the world.

The governor of New York has vetoed a bill which aimed to give to the Public Service Commission authority to suspend passenger tariffs pending investigation as to their reasonableness.

The Ohio State College of Agriculture, using a train furnished free by the New York, Chicago & St. Louis, will give lectures along the line of that road on May 1, 2 and 3, stopping at 17 places.

The legislature of the Island of Jamaica has taken action looking to the subsidizing of a line of steamships to be run by the Canadian Pacific Railway weekly between Jamaica and a port in Canada.

It is announced that about June 1 the Pennsylvania will put in service a new 26-hour train, to be known as the "Broadway Limited," between Chicago and New York over the Panhandle route. This will be a solid, all-steel train of vestibuled cars.

The government has brought four suits in the federal court at New York City against the New York Central to receive penalties for keeping seven loads of hogs in the cars beyond the length of time allowed by law. The alleged offenses took place in January and February, 1911.

Arrangements have been completed by the tours department of the Chicago & North Western and Union Pacific for its twelfth season of summer vacation travel. The programme includes seven 15-day Yellowstone Park tours and tours to California, the Pacific coast, Yosemite National Park, Lake Tahoe, Alaska and other points of interest.

The "Bulletin of Business Openings in Western Canada," which is issued quarterly by the Grand Trunk, has just appeared for the month of April. It gives in much detail the wants of all the principal places on the Grand Trunk Pacific west of Winnipeg. Doctors, druggists and school teachers are wanted everywhere, as well as blacksmiths, barbers, tailors, etc.

Effective April 28 a change in time will be made on several of the through trains of the Chicago, Milwaukee & St. Paul. The "Columbian," now leaving Chicago at 10 a. m. for the Pacific coast, will leave thereafter at 10:30, and No. 5, the day express, will leave at 9:30 a. m. instead of 9:15. The changes are made to insure better connections with trains arriving from the East.

United States Senator Rayner, of Maryland, has introduce a bill which is intended to make it possible to bring a suit against such joint stock associations as the Adams Express Company for violations of the interstate commerce act. The introducing of the bill followed a decision by Judge Hollister, in the United States circuit court, holding that since the Adams Express Company was neither an individual nor a corporation, suits would have to be brought against individual stockholders for violations of the interstate commerce act.

At a meeting of the Transcontinental Passenger Association in Chicago on April 17 consideration was given to a proposition to extend the annual homeseekers' fares which have heretofore been in effect only to points as far west as Arizona, New Mexico, Utah and Idaho, to the Pacific coast, on the basis of $65 for the round trip. It is understood that the Western Pacific advanced the proposition and that several other roads were also in favor of it, but that it was opposed by the Atchison, Topeka & Santa Fe and the Southern Pacific. No decision was reached, and the question was referred to a later meeting.

At a meeting of the executive committee of the American Association of General Passenger and Ticket Agents, of which C. A. Cairns, general passenger agent of the Chicago & North Western, is president, held in Chicago on April 19, arrangements were made for the next annual convention of the association, which will be held at Seattle, Wash., on September 12. The preparation of the docket is in charge of a committee of which A. Hilton, general passenger agent of the St. Louis & San Francisco, is chairman. Among the subjects to be considered will be advertising and the most effective methods of distributing folders, pamphlets, etc., with a view to avoiding a waste of material, uniform methods of ticketing, the development of summer and winter tourist traffic and the simplification of ticket requirements.

The Committee on Foreign Relations of the House of Representatives has filed in Congress a report in favor of meeting the expenses of delegates to a proposed Congress in this country of Chambers of Commerce and Commercial and Industrial Associations from all over the world. The proposed amount of the appropriation is $50,000 to cover, among other things a tour by the foreign delegates to the principal commercial, industrial, agricultural and social centers of the United States to acquaint them with our institutions and enterprises. The Secretary of State is requested to ask the governments of the commercial nations of the world to notify the leading business organizations of their respective countries of this action.

Traffic Club of New York.

The regular meeting of the Traffic Club of New York will be held at the Waldorf-Astoria hotel, April 30. Col. W. B. Dunn, chief of the bureau for the safe transportation of explosives, will deliver an illustrated lecture on the subject of his work and experience.

New York City Rapid Transit.

Governor Dix of New York has signed the Wagner bill giving the Public Service Commission, with the approval of the city Board of Estimate, power to make contracts with companies operating or agreeing to operate existing subway lines, for equipment and operation of municipal lines in connection with their present system.

Following his approval of the Wagner bill Mayor Gaynor of New York last week signed, orders legalizing the following subway routes which the Brooklyn Rapid Transit Company will construct as its portion of the proposed dual subway system:

Eastern Parkway, including Flatbush avenue, with Brighton Beach connection; the Utica avenue connection, the Livonia avenue connection, the Livonia avenue route (separate from the Livonia avenue connection), the Nostrand avenue route, the Fifty-ninth street route and over the Queensboro bridge to Woodside and Astoria and the Roosevelt avenue route. No provision for operating the Fourth avenue (Brooklyn) subway has been made so far, but it will probably be operated in connection with the B. R. T. system.

Frisco Agents to Handle Industrial Matters.

In the *Railway Age Gazette* of February 16, page 278, was published a description of a plan being worked out on the St. Louis & San Francisco of extending the authority of the station agent by giving him power to represent the company in the solicitation of traffic and in the settling of claims within certain limits. In pursuance of this same policy, Frank Anderson, industrial commissioner, has issued a circular letter to the station agents of the Frisco lines, vesting them with the authority to represent the industrial department locally and thus to transact directly a great deal of business relating to the development of the towns and community in general. The letter to the agents is in part as follows:

"Heretofore, the industrial department has been without a local representative in each town and community on our lines, but beginning with this date, you are the industrial agent and the actual representative of this department, in your town and community. It is through you that this department will deal with the people of your town and surrounding country. No representative of this company knows the local conditions or the industrial possibilities of your town and country better than you.

"It is the desire of this department that you cooperate with

the business men's commercial associations and the farmers' organizations, in the interest of the upbuilding of your town and surrounding country. You should meet and discuss with them all industrial matters, such as securing new industries for your town, the development of your surrounding country, and all other matters which might in any way assist in the upbuilding of your town and community, the people of which I am sure, will be glad to cooperate with you fully when they know you are the actual industrial representative, and are ready to cooperate with them. I will be glad if you will inform your business men and farmers, in whatever way you choose, that you are ready to cooperate with them in every possible way, and that you are the representative of this department on the ground, with whom they can deal at any and all times."

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 117, giving a summary of car shortages and surpluses by groups from December 7, 1910, to April 11, 1912, says:

"The total surplus on April 11, 1912, was 94,943 cars; on March 27, 1912, was 52,682 cars; on April 12, 1911, was 187,219 cars.

"Compared with the preceding period there is an increase of 42,261 cars, of which 2,935 are box and 36,260 are coal cars. The increase in box car surplus is most noticeable in groups 3 (Ohio, Indiana, Michigan and Western Pennsylvania); 6 (Iowa, Illinois, Wisconsin, Minnesota and the Dakotas), and 10 (Oregon, Idaho, California, Arizona and Washington), although there are slight increases in all other groups with the exception of groups 7 (Montana, Wyoming and Nebraska), 8 (Kansas, Colorado, Missouri, Arkansas and Oklahoma) and 9 (Texas, Louisiana and New Mexico), where a decrease is shown. The increase in coal car surplus is general throughout the country except in group 7 (as above), but is most pronounced in groups 2 (New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania) and 3 (as above). This is doubtless attributable to the suspension of coal traffic.

"The total shortage on April 11, 1912, was 15,554 cars; on March 27, 1912, was 33,974 cars; on April 12, 1911, was 1,166 cars.

"Compared with the preceding period there is a decrease of 18,420 cars, of which 9,767 are box, 6,937 coal and 2,149 miscellaneous cars, with an increase of 433 in flat cars. The decrease in box car shortage is general except in groups 7 and 10 (see above), where a slight increase is shown. The decrease in coal car shortage is also general throughout the country. Compared with the same date of 1911 there is a decrease in total surplus of 92,276 cars, of which 29,923 is in box and 45,156 in coal cars. There is an increase in total shortage of 14,388 cars, of which 9,533 is in box and 563 in coal cars."

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and the diagrams show total bi-weekly surpluses and shortages in 1907 to 1911.

Freight Car Balance and Performance.

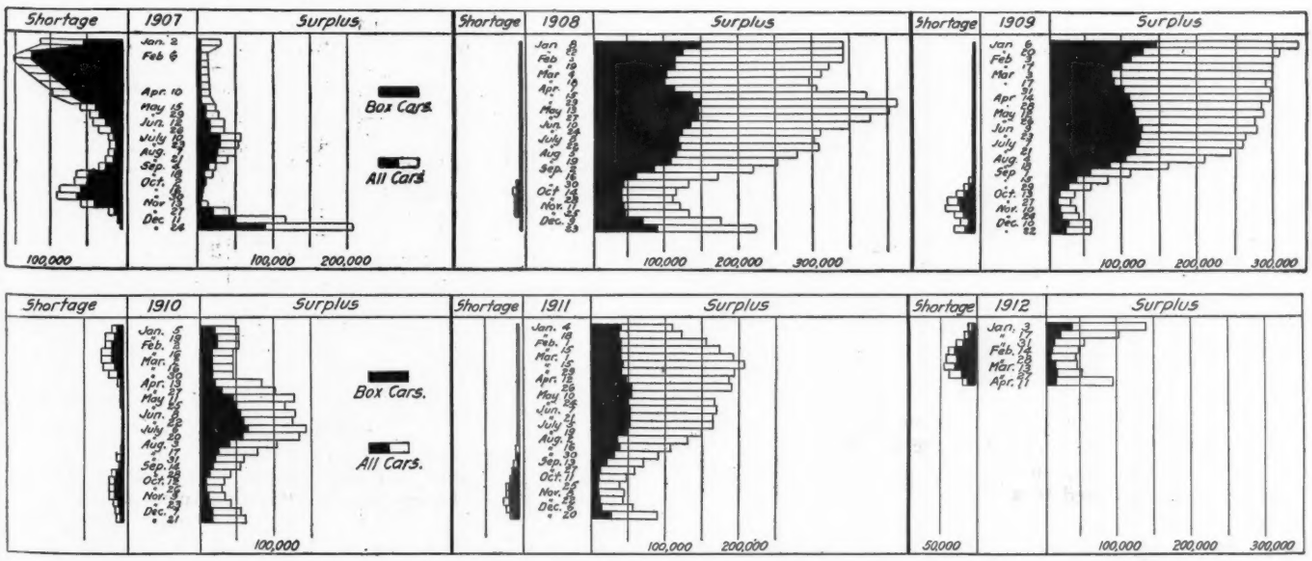
Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 118, covering car balance and performance for December, 1911, says:

"The per cent. of cars on home line remains the same as in November, viz., 56; this compares with 55 per cent. in December, 1910. There is a decrease in the per cent. of loaded mileage from 70.8 in November to 68.0 in December. The percentage of loaded mileage is 1.7 less than it was a year ago. The average miles per car per day shows a further decrease of 1.0 miles to 23.4 from the November figure, but an increase of 0.7 miles

Car Surpluses and Shortages.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—April 11, 1912	7	729	1,278	2,203	283	4,493	169	71	0	0	240
" 2.— " 11, 1912	26	453	117	21,485	471	22,526	767	6	1,029	1	1,803
" 3.— " 11, 1912	27	475	296	12,941	2,621	16,333	588	305	60	2,003	2,956
" 4.— " 11, 1912	10	282	48	355	1,189	1,874	1,447	425	123	255	2,250
" 5.— " 11, 1912	19	76	186	933	745	1,940	1,295	90	0	45	1,430
" 6.— " 11, 1912	24	5,111	269	4,936	4,620	14,936	670	58	0	132	860
" 7.— " 11, 1912	3	0	72	182	82	336	211	0	10	6	227
" 8.— " 11, 1912	16	2,447	388	2,191	2,062	7,088	23	0	0	204	227
" 9.— " 11, 1912	10	1,481	250	200	1,061	2,992	0	0	0	0	0
" 10.— " 11, 1912	22	6,562	2,747	3,374	9,426	22,109	71	5	0	0	76
" 11.— " 11, 1912	5	0	33	0	283	316	4,405	377	0	703	5,485
Total	169	17,616	5,684	48,800	22,843	94,943	9,646	1,337	1,222	3,349	15,554

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.

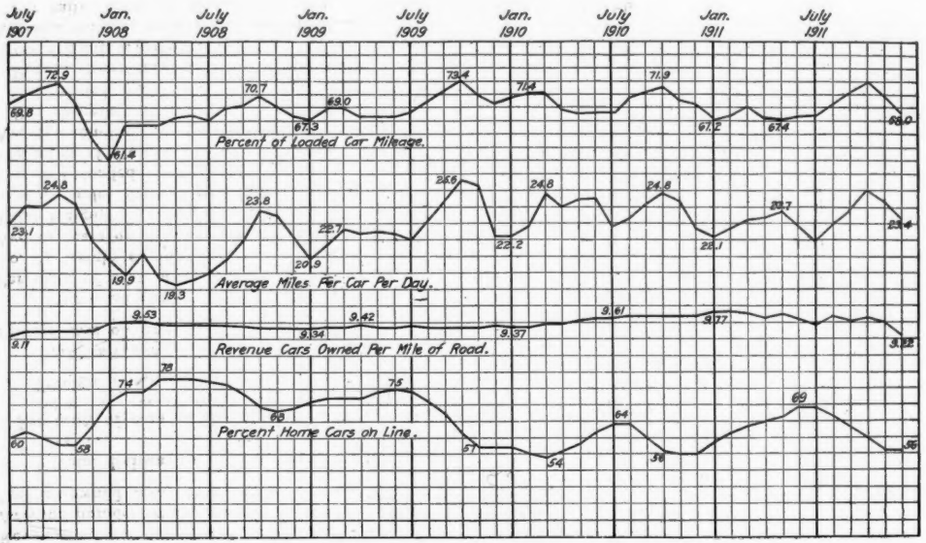


Car Surpluses and Shortages in 1907 to 1912.

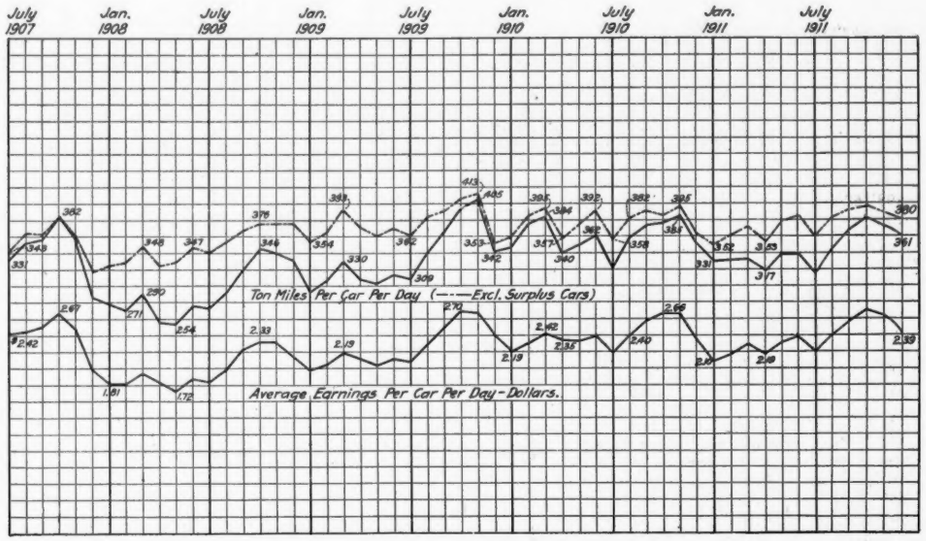
CAR BALANCE AND PERFORMANCE IN 1911.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Total.
Roads reporting—												
Number	6	26	19	11	20	17	3	12	14	19	6	153
Mileage operated	6,916	31,616	14,046	19,267	18,974	56,563	4,023	22,287	8,900	26,791	17,298	226,681
Number revenue freight cars owned	83,377	696,221	216,927	184,097	173,402	390,584	18,501	136,119	29,029	144,635	105,384	2,178,276
Per cent. railway cars on line—												
Home	56	*62	64	61	60	70	39	64	78	45	71	*63
Foreign	50	*34	40	34	33	29	66	37	72	38	34	*35
Total	106	*96	104	95	93	99	105	101	150	83	105	*98
Excess on line over number owned	4,723	.....	9,305	.....	.....	.....	998	725	14,703	.....	5,331	.....
Per cent. cars in shop	6.52	*7.07	8.18	6.66	8.67	6.97	6.24	8.46	5.36	5.54	6.85	*7.21
Average cars on line per freight engine owned	72	*67	79	57	63	63	41	54	61	50	53	*63
Average miles per car per day	17.8	*22.8	20.6	23.6	24.0	22.9	38.7	21.7	23.7	29.3	27.1	*23.3
Per cent. of loaded mileage	72.4	66.2	68.1	65.5	70.0	71.0	73.4	69.2	67.7	71.7	75.6	68.9
Average ton miles—												
Per car	11.1	15.7	15.7	15.3	13.6	13.7	15.6	13.5	12.1	14.6	14.1	14.7
Per loaded car	15.3	23.6	23.0	23.6	19.2	19.7	21.1	19.7	17.4	20.4	18.6	21.4
Per day per car	197	*365	328	360	326	320	628	295	282	427	381	*344
Average daily earnings—												
Per car owned	$2.42	*$2.24	$1.96	$2.11	$2.19	$2.38	$5.19	$2.52	$4.10	$3.63	$2.85	*$2.43
Per railway car on line	$2.29	*$2.35	$1.88	$2.22	$2.35	$2.41	$4.94	$2.51	$2.72	$4.33	$2.69	*$2.47
All cars on line	$2.21	*$2.20	$1.79	$2.18	$2.25	$2.32	$4.54	$2.39	$2.52	$3.94	$2.62	*$2.35

*NOTE.—Average of 105,278 Cars owned in Group 2 eliminated in calculations starred.



Car Performance in 1907 to 1912.



Car Earnings and Loading in 1907 to 1912.

FREIGHT CAR BALANCE AND PERFORMANCE IN DECEMBER, 1911.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	87,199	499,242	213,724	185,746	169,288	393,258	18,264	135,297	18,976	143,879	110,892	1,975,765
Average number of system cars on line	45,663	286,545	109,927	102,465	89,600	240,600	6,072	70,105	16,238	60,549	73,793	1,101,557
Railway-owned cars: Average foreign on line	52,051	178,185	95,732	66,839	74,580	134,696	12,385	64,526	25,770	66,224	50,190	821,178
Total Railway-owned cars on line	97,714	464,730	205,659	169,304	164,180	375,296	18,457	134,631	42,008	126,773	123,983	1,922,735
Excess	10,515	.....	.....	.....	.....	.....	193	.....	23,032	.....	13,091	.....
Per cent. of cars on line to total owned:												
Home	52	57	51	55	53	61	33	52	85	42	67	56
Foreign	60	36	45	36	44	34	68	47	136	46	45	41
All railways	112	93	96	91	97	95	101	99	221	88	112	97
Private cars on line	4,485	31,232	12,001	4,269	7,575	15,211	2,116	5,683	2,119	12,214	3,037	99,942
Total, all cars on line	102,199	495,963	217,659	173,573	171,755	390,507	20,573	142,576	44,127	138,987	127,020	2,024,939
Per cent. of cars in shop	6.23	6.83	6.70	6.27	7.95	6.31	5.47	8.75	5.38	4.74	6.30	6.68
No. of freight engines owned	1,418	7,807	3,053	3,149	2,692	6,438	525	2,662	560	2,703	2,161	32,438
Average cars on line per freight engine owned	72	64	71	55	64	61	39	54	79	51	59	62
Total freight-car mileage	56,767,350	523,750,304	146,347,398	130,735,903	116,161,130	272,256,318	22,771,566	106,586,803	29,420,771	121,130,828	107,363,494	1,633,291,865
Average miles per car per day	17.9	22.9	21.7	24.3	21.8	22.5	35.7	25.4	21.5	28.1	27.3	23.4
Per cent. loaded mileage	70.0	64.6	69.4	65.7	71.1	70.0	75.5	61.4	69.0	70.9	76.6	68.0
Ton-miles of freight, including company freight	639,586,108	8,474,959,453	2,389,844,754	2,072,519,759	1,628,106,099	2,742,248,801	372,616,357	1,291,682,304	282,943,411	1,767,590,924	1,701,060,389	23,353,158,359
Average ton-miles, including company freight:												
Per car-mile	11.1	16.2	16.7	15.9	14.0	15.0	16.8	12.1	11.9	16.0	16.0	15.2
Per loaded car-mile	15.8	25.0	24.4	24.2	19.8	21.7	22.2	19.5	17.6	20.9	20.8	22.5
Per car per day	199	390	363	387	307	345	617	307	266	415	434	361
Gross freight earnings	$6,705,189	$47,576,044	$12,416,689	$12,469,406	$11,470,143	$28,197,783	$2,904,584	$10,488,890	$3,384,499	$16,068,639	$10,568,032	$162,249,894
Average daily earnings: Per car owned	$2.48	$2.27	$1.87	$2.17	$2.19	$2.31	$5.13	$2.50	$5.75	$3.60	$3.07	$2.45
Per railroad car on line	2.21	2.42	1.95	2.38	2.25	2.42	5.08	2.51	2.60	4.09	2.75	2.51
All cars on line	2.12	2.29	1.84	2.32	2.15	2.33	4.55	2.37	2.47	3.73	2.68	2.39

over December, 1910. The increase of 0.6 in the ton miles per loaded car indicates improved loading, but the decrease in average ton miles per day for all cars from 376 in November to 361 in December shows the effect of the decreased percentage of loaded mileage. There is an increase of 12 ton miles per car over the figure for the month of December, 1910.

"The earnings per car per day show a decrease from $2.64 in November to $2.39 in December, 1911. Compared with December, 1910, however, an increase of $0.05 is shown."

The accompanying table on this page gives car balance and performance in the month covered by the report, and the two diagrams on the preceeding page show car earnings and car mileage and certain car performance figures monthly from July, 1907.

The table on the preceeding page gives freight car balance and performance figures by groups for the entire calendar year 1911. The American Railway Association also publishes total figures for six month periods.

Canadian Pacific Colonization Plan.

A new plan of colonization, by which the Canadian Pacific expects to spend several million dollars in making loans of $2,000 each to prospective colonists in western Canada who have demonstrated their ability on a productive farm and who have the machinery and some money, but who lack enough funds to buy and stock a farm and the necessary buildings, was announced last week. This opportunity at first will be opened to 250 men of family now farming rented land. They will be required to make a payment of one-tenth of the purchase price of the farm and to have in reserve enough to maintain their families for a year. They must personally inspect and select the land they buy. The $2,000 loan will be used to pay for buildings, fencing the farm and cultivating at least 50 acres. The amount will be added to the cost price of the land and will be payable during a period of ten years with 6 per cent. interest. Thirty model farms are to be operated by the railway for a period of five years, and the results of the experiments undertaken on these farms will be made public in monthly bulletins.

The National Chamber of Commerce.

The meeting which was held in Washington on Tuesday and Wednesday of this week, in accordance with the call issued by President Taft some weeks since, to establish a national commercial organization, was attended by more than 600 delegates and a permanent organization was decided upon the first day of the meeting, its name to be that shown in the title of this paragraph. Chambers of Commerce, boards of trade, and similar associations from all over the country were represented, and by-laws were adopted providing for a thorough system of getting a reliable expression of commercial opinion at any time. The power and influence of the new body is not to be given to any proposition except by approval of a substantial majority of the commercial associations of the whole country. A permanent office is to be established in Washington. The chairman of the new association is H. A. Wheeler, of Chicago. Congress will be applied to for an act of incorporation.

Optimistic Shippers.

A prominent dry goods man says: "Conditions throughout this country are better than at any time in years. I know of concerns that are doing from 100 per cent. to 150 per cent. more business in dry goods for the fall trade, than at this time last year. Such factors as these have been behind the recent buying of securities by the so-called insiders, and it is this healthy improvement in trade lines that is responsible for the better railway earnings now being published.

"Great Northern rolled up an increase in gross in February of $750,000, or 21 per cent. Pennsylvania gained nearly 18 per cent. Union Pacific shows a gain for February of $570,000, or about 10 per cent. New York Central is doing a rushing business, as you will see by the February statement. In the South, Southern Railway shows a very healthy growth, and even Boston & Maine is pushing its head up with 7 per cent. larger earnings than February a year ago. These results clearly spell widespread prosperity."—*Wall Street Journal.*

INTERSTATE COMMERCE COMMISSION.

The commission has suspended the effective date of the order in the Shreveport case to June 1, 1912.

The Interstate Commerce Commission has suspended until August 17 Leland's tariff I. C. C. No. 908 and its supplement. This tariff and supplement make changes in the class and commodity rates between Texarkana, Ark., and New Orleans, La. The advances on the various articles named in the tariff, range from one to eight cents per 100 lbs.

The commission, in the complaints of discrimination in the distribution of coal cars has awarded reparation against the Pennsylvania Railroad Company, aggregating in five cases $129,722. It finds that the road has been guilty of unlawful discrimination in the distribution of its cars by reason of which five complaining coal companies had been unable fairly to market their products. Never before has the commission awarded damages in cases of this kind; the question has been referred to the courts. The orders require the Pennsylvania to pay to the Hillsdale Coal & Coke Company $27,193, to W. F. Jacoby & Co., $21,094, to Clark Brothers $31,128, to the Bulah Coal Company $31,716, and to James W. Minds $18,592.

Reparation Awarded.

Casey-Hedges Co. v. Alabama Great Southern et al. Opinion by the commission:

Grate bars were given the furnace castings rate when they should have been given the "castings N. O. S. plain as from the sand" rate. (23, I. C. C. 249.)

C. E. Ferguson Saw Mill Co. v. St. Louis, Iron Mountain & Southern et al. Opinion by the commission:

In Ferguson Saw Mill Co. v. St. Louis Iron Mountain & Southern, 18 I. C. C. 396, the commission found rates on cypress lumber to certain points in Oklahoma, Kansas and Missouri unreasonable, and the commission now extends this ruling to a number of other points on other roads besides the St. L. I. M. & S. (23 I. C. C. 229.)

E. Rickards v. Atlantic Coast Line. Opinion by the commission:

A different rate from the same points of origin to destination has been charged on mine prop logs and on saw mill logs. The only justification is that the cost of service on saw lumber is less because it moves in train loads, while the mine props move in carloads. The commission refuses to recognize this as a proper reason for making a difference in the rates. (23 I. C. C., 240.)

Complaint Dismissed.

Chamber of Commerce of Houston, Tex., et al. v. Galveston, Harrisburg & San Antonio et al. Opinion by Commissioner Lane:

In this case the complainants allege that an increase in the differential rate from three cents to five cents over Galveston is discriminatory against Houston. The commission found that this differential was made in an effort to correct a discrimination in the manner best calculated to put the rates from all Texas milling cities in fair relation to each other. The complaint was dismissed. (23 I. C. C., 215.)

New Orleans Board of Trade, Ltd., v. Galveston, Harrisburg & San Antonio et al. Opinion by Commissioner Lane:

In this case the complainants claim that as the rates on clean rice and rough rice from nearly all Texas points to New Orleans are equal, the New Orleans millers are excluded from competing with Texas millers in the purchase of rough rice from Texas producers, because it takes 180 lbs. of rough rice to make 100 lbs. of clean rice, and therefore the New Orleans millers who buy the rough rice from Texas producers, have to pay the same rate per pound on the 80 lbs. of relatively worthless by-product as on the 100 lbs. of valuable product. The commission found that the rates complained of were a part of a rate adjustment which had been arrived at after years of competition between markets, and that whether a differential were established by raising the clean rice rate or lowering the rough rice rate, numerous other rates would thereby be disturbed, and decided that the rough rice rates complained of were not unduly discriminatory. The complaint was dismissed. (23 I. C. C., 210.)

Indianapolis Freight Bureau v. Cleveland, Cincinnati, Chicago & St. Louis et al., on rehearing, and Railroad Commission of Indianapolis v. Wabash Railroad et al. Opinion by Commissioner Clark:

The complainants point out alleged discriminations against Indianapolis in favor of Chicago in the total charges on shipments to and from the Atlantic seaboard. The commission found that these rates were governed by different classifications and that they could not be the same unless a uniform classification existed. It also found that the defendants had established rates somewhat more favorable to Indianapolis than those which had been ordered in the original Indianapolis case and that the former conclusions should be adhered to. Complaint was dismissed. (23 I. C. C. 195.)

Advanced Rate on Candles Refused.

Charles T. Perry & Co. v. Northern Pacific et al. Opinion by the commission:

The rate on candles from Helena, Mont., was raised because of the complaint of competitors at other points, but no evidence was shown that the cost of service had increased. The commission therefore finds that the railways have not justified the advance. (23, I. C. C. 247.)

Discrimination Against Columbia, S. C.

E. M. Du Pre Co. et al v. Buffalo, Rochester & Pittsburgh et al. Opinion by Commisisoner McChord:

The complainants allege that Columbia, S. C., is unjustly discriminated against in favor of Augusta, Ga., in carload rates on apples, potatoes, cabbages and onions from Rochester, N. Y. The commission decided that the conditions were not sufficiently different to justify a higher rate to Columbia, and ordered that Columbia be given the same rates as Augusta. The complainants will be awarded reparation on this basis. The complainants also allege that 24,000 lbs. of grapes, the existing C. L. minimum, cannot be loaded into a car without serious damage to the bottom tier. The commission decided that since it was usually advantageous to the shipper to have a high minimum and a lower rate, and as the question of the rate was not before it, it could not order the defendants to cease applying the existing minimum. The complaint was dismissed. (23 I. C. C., 226.)

Rates on Rice Reduced.

Mutual Rice Trade & Development Association of Houston v. International & Great Northern et al. Opinion by Commissioner Lane:

Complainants in this case attack as discriminatory the rates on clean rice from Texas milling points to central freight association territory, to Illinois, to the Pacific coast and to the southeast in favor of New Orleans. The commission decided that the rates to the central freight association territory, to Illinois and to the Pacific coast were not proven to be discriminatory. It was found, however, that the rates to the southeast instead of being a through rate were a combination of local carload rates, while New Orleans enjoyed an any quantity rate to the southeast. As this any quantity rate was not as low as carload rates should be, and as it was one of the local rates which Texas shippers had to pay to reach the southeast, and as practically no terminal service was performed at New Orleans on through shipments from Texas, the commission decided that the through rate on carloads from Texas should be at least five cents per 100 lbs. less than the lowest combination of local rates. (23 I. C. C., 220.)

Precooling Privilege Granted to Shippers.

In re investigation and suspension of certain regulations and practices with regard to pre-cooling and pre-icing. Opinion by Chairman Prouty:

In this case the complainants urge that the privilege of precooling at a reasonable rate per car be restored. In Arlington Heights Fruit Exchange v. Southern Pacific, 20 I. C. C., 106, the commission reduced the charge of the defendants for precooling from $30 to $7.50 per car. The carriers filed tariffs

establishing the rate of $7.50 per car, but immediately after withdrew the privilege of precooling altogether. The defendants claim that precooling is refrigeration and is part of the transportation service which they are now compelled to provide. The commission decided that shippers have the right to precool in lieu of paying the railways for refrigeration, that $7.50 per car is a reasonable charge for the use of the car for precooling. The tariffs providing for precooling should be restored. (23 I. C. C., 267.)

Ashburn, Ga., Discriminated Against.

Chamber of Commerce of Ashburn, Ga., et al. v. Georgia Southern & Florida et al. Opinion by Commissioner Clark:

This complaint alleges that rates to and from Ashburn are unjustly discriminatory in favor of Cordele, Ga., Tifton, Fitzgerald and Albany. The commission decided that though the defendants could reduce rates to meet competition, they could not maintain rates to nearby points which resulted in discrimination, and that Ashburn should be given the same rates as Tifton. (23 I. C. C., 140.)

STATE COMMISSIONS.

Members of the Indiana and Minnesota commissions, accompanied by fifteen officers of Indiana railways on Tuesday last visited the Bessemer rail mill of the Illinois Steel Company at South Chicago, and the open hearth mill of the Indiana Steel Company at Gary, Ind.

The New York Public Service Commission, Second district (up-state), has fixed May 2 as the date on which to reopen the hearing on the petition of the New York, New Haven & Hartford to be allowed to buy the stock of the Rutland, now held by the New York Central & Hudson River. The New Haven now has half of the majority stock and the New York Central the other half.

The Texas railway commission has issued a notice of a hearing on May 15 to consider a change in General Rule No. 2 governing rate applications in the state. The present rule provides "that the rate between two given points shall not in any case exceed the sum of the rates applying between such given points and a point intermediate." It is proposed to change the rule to read, "the rate between two given points in the state shall not in any case exceed the sum of the rates applying between such given point and a third point in the state."

COURT NEWS.

The full-crew law of Pennsylvania has not yet been before the Supreme Court of the state. The decision sustaining the law, which was recently announced, was by the court of Dauphin county.

Suits were filed in the Superior Court at Chicago on April 22 by the W. C. Craig Company, the Newburger Cotton Company and the Luckett-Sabin Cotton Company, of Mississippi, against the Yazoo & Mississippi Valley, to recover damages aggregating $166,000 for cotton burned in the warehouse of the Gulf Compress Company on June 11, 1911. It is alleged that sparks from a locomotive set fire to the buildings.

The decision of the Supreme Court of the United States, reversing the Supreme Court of the State of Arkansas on the question of liability of railways for live stock killed, which was noticed in the *Railway Age Gazette* of April 19, page 934, is based on the ground that the statute, as construed and applied, is wanting in due process of law, and repugnant to the 14th amendment of the Constitution of the United States. The opinion of Justice Van Devanter is not predicated wholly on the simple point that imposing double liability as a penalty for 30 days' delay is so severe as to be wanting in due process of law; indeed, the court purposely refrains from considering the question in this shape. The salient point is that the complainant whose animals, two horses, were killed, demanded $500 for them, and then after the expiration of 30 days brought suit to recover damages, but claimed only $400. The jury granted this sum and the court doubled it, adding $50 for an attorney's fee. As the owner thus confessed that his first claim was excessive, the court holds that the railway, in resisting payment of this excessive sum, was lawfully exercising an undoubted right. It could never have been the purpose of the legislature to make the railway company pay a penalty for contesting a claim which it did not owe.

St. Louis Terminal an Unlawful Monopoly.

The Supreme Court of the United States in a decision in the case against the Terminal Railroad Association of St. Louis, handed down this week, holds the association and fourteen railways entering that city and owning the terminal company to be a combination operated, in violation of the Sherman anti-trust law, to control transportation across the Mississippi river at St. Louis. The combination is ordered to reorganize.

Justice Lurton, who announced the decision, which was unanimous, said it was not contended that every terminal company in every city was a violation of the Sherman law. It might be a facility instead of a restraint on interstate commerce; but at St. Louis topographical conditions made it impracticable for any road to reach the city without using the terminal company's facilities across the Mississippi. The combination of the three crossings owned by the Terminal Company gives control over competition. Ninety days was allowed the combination in which to reorganize. The conditions for reorganization are laid down as follows:

First—By providing for the admission of any existing or future railways to joint ownership.

Second—By providing for use by other roads without becoming a joint owner.

Third—By removing the provision of the present combination which restricts a company to the use of the terminal facilities.

Fourth—By abolishing the practice of billing to East St. Louis and other junction points and then rebilling traffic destined to St. Louis.

Fifth—By abolishing arbitrary charges (which are in force on certain traffic moving less than 100 miles).

Sixth—By providing that any disagreement between a company applying to become a joint owner or user and the fourteen proprietary companies may be submitted to the district court.

Seventh—By still leaving the companies under the control of the Interstate Commerce Commission as to rates.

The court also provided that if the parties failed to meet the conditions of reorganization, the lower court should, after hearing, make a decree of disjoinder of the Terminal Company, the Wiggins Ferry Company and the Merchants' Bridge Company.

The decision affords an interesting illustration of what is meant by the "rule of reason" which Chief Justice White outlined in his opinion in the Standard Oil case.

The St. Louis case arose out of the fact that the nine railways entering St. Louis have practically monopolized the terminal facilities, and have thereby controlled the entrance to the city to such an extent that for any other road to gain admission to the terminal at all is practically out of the question. One of the regulations has been a requirement that no privileges should be granted to any new company so long as any one of the present partners should object. The decision refers to the Standard Oil and Tobacco decisions at some length, and says that the real question is whether the agreement between the roads violates the rule of reason and thereby introduces an unreasonable degree of restraint upon trade.

The opinion says that there is nothing in the decision to interfere with the operations of the Interstate Commerce Commission, but that on the contrary the commission can go on and regulate rates, terminal charges, and require rates of every kind on the part of the roads and can enforce these decisions by the usual methods. In the event of charges being made by these roads to a new road desirous of gaining access to the city over the existing tracks the charges may be considered by the commission for the purpose of seeing whether they are fair and reasonable, and if not of making them so.

. . . Whether a city railway system is a facility in aid of interstate commerce or an unreasonable restraint forbidden by the act of Congress, as construed and applied in the Standard Oil and Tobacco cases, will depend upon the intent to be inferred from the extent of control thereby secured over instrumentalities which such commerce is under compulsion to use, the method by which such control has been brought about and the manner in which that control has been exerted.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

R. F. Gauld, who has been connected with the financial and accounting departments of the Canadian Pacific for many years, has been appointed auditor of pay rolls, with headquarters at Montreal, Que.

George L. Sands, vice-president of the Missouri & North Arkansas, at Eureka Springs, Ark.; Jesse McDonald and W. S. Holt, have been appointed receivers of the Missouri & North Arkansas, with headquarters at St. Louis, Mo.

J. C. Wallace, auditor of disbursements of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, has been appointed assistant auditor, with office at Cincinnati, succeeding E. P. Higgins, deceased. H. L. Berg, assistant auditor of disbursements, succeeds Mr. Wallace.

Edwin Gould, president of the St. Louis Southwestern, with headquarters at New York, has been elected chairman of the board, a newly created office. F. H. Britton, vice-president and general manager, with office at St. Louis, Mo., has been elected president and general manager, and H. E. Farrell, freight traffic manager, with office at St. Louis, has been elected vice-president in charge of freight traffic, effective May 1.

Pending the election of a successor to the late President Hays of the Grand Trunk and the Grand Trunk Pacific, William Wainwright, vice-president of the Grand Trunk, with headquarters at Montreal, Que., has been placed in temporary charge of Grand Trunk affairs, and E. J. Chamberlin, vice-president and general manager of the Grank Trunk Pacific, with headquarters at Winnipeg, Man., has been placed in temporary charge of that company's affairs.

Herbert H. Adams, general manager of the Toronto, Hamilton & Buffalo at Hamilton, Ont., has been elected president of the Kansas City Terminal Railway, with office at Kansas City, Mo., succeeding W. S. Kinner, resigned, effective May 1, as has been announced in these columns. Mr. Adams was born in August, 1876, at Detroit, Mich., and was educated at Johns Hopkins University and the Massachusetts Institute of Technology, receiving the degree of B. S. from the latter in 1899. In July, 1899, he began railway work with the Michigan Central as rodman and draftsman. He was then consecutively assistant engineer, assistant chief engineer and assistant division superintendent, and in February, 1904, was appointed division superintendent, which position he held until he left the Michigan Central in October, 1909. He then went with the Toronto, Hamilton & Buffalo as general superintendent, and a year later was promoted to general manager, which office he will resign on May 1 to go to the Kansas City Terminal.

H. H. Adams.

Roberts Walker, chairman of the executive committee and general counsel of the Chicago, Rock Island & Pacific Railway, with headquarters at New York, has resigned to become a member of the firm of White & Case, which is to act as eastern counsel for the Rock Island system. Mr. Walker retains his place on the railway company's board, but has also resigned as president of the Rock Island Company, and as president of the Chicago, Rock Island & Pacific Railroad, a holding company. W. H. Moore, a director of the Chicago, Rock Island & Pacific, has been elected chairman of the executive committee, with headquarters at New York. F. C. Dillard, interstate commerce attorney for the Harriman Lines at Chicago, has been elected vice-president and general counsel of the Chicago, Rock Island & Pacific Railway, with headquarters at Chicago. Edward S. Moore, vice-president of the Chicago, Rock Island & Pacific Railway, with office at Chicago, has been elected also president of the Chicago, Rock Island & Pacific Railroad, with headquarters at Chicago. J. J. Quinlan, assistant secretary and assistant treasurer of the Chicago, Rock Island & Pacific Railway, and the Chicago Rock Island & Pacific Railroad, and vice-president, secretary and treasurer, of the Rock Island Company, with office at New York, has been elected president of the Rock Island Company, with headquarters at New York. These elections complete the changes, making Chicago the operating headquarters of the Rock Island system, with H. U. Mudge, president, and all the operating officers of the railway company located there, and New York the financial headquarters, with W. H. Moore, chairman of the executive committee, and D. G. Reid, chairman of the board of directors of the railway company.

Frank Clifford Dillard, the new vice-president and general counsel of the Chicago, Rock Island & Pacific Railway was born at Auburn, Ala., and graduated from the Alabama Polytechnic Institute. From 1883 to 1907 he was engaged in the practice of law at Sherman, Tex., in the firms of Bryan & Dillard; Head & Dillard; Head, Dillard & Muse, and Head, Dillard & Head. During this time he represented some of the lines now comprising the Harriman system in a legal capacity. In 1907 he removed to Chicago as head of the department of legal work relating to interstate commerce of the Harriman Lines, with the title of interstate commerce attorney, which position he held until his election as general counsel of the Rock Island. He is an ex-president of the Texas Bar Association, and was a delegate to the Universal Congress of Lawyers and Jurists at St. Louis in 1904.

F. C. Dillard.

Frank H. Britton, who has been elected president and general manager of the St. Louis Southwestern, with office at St. Louis, Mo., was born November 29, 1850, at Ovid, N. Y., and began railway work in August, 1868, as a telegraph operator on the Michigan Southern & Northern Indiana. The next year he went to the Chicago & North Western, where he was in the telegraph department for two years; and from November, 1871, to June, 1882, he was with the Louisville & Nashville, having been consecutively assistant train despatcher, chief train despatcher and master of trains. He then became superintendent of transportation of the Chesapeake, Ohio & Southwestern at Louisville, Ky., and from February, 1883, to February, 1892, he was with the Baltimore & Ohio, first as superintendent of transportation and later as superintendent of the Chicago division. He was made superintendent of the Minnesota & Wisconsin in June, 1893, and in September of the following year went with the Great Northern, where he was consecutively superintendent of the Montana division, superintendent of the Fergus Falls division and assistant general superintendent of the Western district at Spokane, Wash. In June, 1899, he left the Great Northern to become general superintendent of the St. Louis Southwestern at Tyler, Tex., and since March 12, 1900, he has been vice-president and general manager of the system as well as president of the St. Louis Southwestern of Texas. In June, 1904, he was also made president of the Southern Illinois & Missouri Bridge Company. As vice-president and general manager of the St. Louis Southwestern,

and president of the St. Louis Southwestern of Texas, Mr. Britton has had his headquarters at St. Louis, while Mr. Gould's headquarters were in New York. Mr. Britton has been chief resident officer of the road, and as such was largely responsible for the improvement in the condition of that property during recent years. He has for a long time been recognized as a most capable operating officer, and has perhaps exerted more complete jurisdiction over the road in his charge than have operating heads of some other Gould properties. He has the initiative to take the responsibility for any necessary action. Emerging from the receivership in 1891 with a reputation for over-capitalization, the earnings of the company have been largely increased during recent years under Mr. Britton's management, and although no dividends have been paid on the common stock, there have been the following payments on the preferred stock during the last three years: 2 per cent. in 1909, 5 per cent. in 1910, and 2 per cent. in 1911, while large sums were devoted to improvements. Mr. Britton, who started as a telegraph operator, had a most thorough training in the operating department of a wide variety of roads in the Middle West, the Northwest, and the Southwest. He is a good organizer, and has a capacity for getting on with subordinates.

Operating Officers.

John H. Rightmeyer has been appointed trainmaster of the Waterloo terminals and the Albert Lea district of the Illinois Central, with office at Waterloo, Iowa.

J. W. James, hitherto train despatcher on the Buffalo, Rochester & Pittsburgh, has been appointed special representative of the general manager of the road, with headquarters at Rochester, N. Y.

J. J. Scully, general superintendent of the Saskatchewan division of the Canadian Pacific, at Moose Jaw, Sask., has been appointed general superintendent of the Lake Superior division, with office at North Bay, Ont., succeeding J. G. Taylor, transferred.

H. M. Eicholtz, assistant superintendent of the Chicago & North Western at Chicago, has been appointed superintendent, with office at Chicago, succeding P. J. O'Brien, resigned on account of ill health, and J. G. Cowan, assistant superintendent at Clinton, Iowa, succeeds Mr. Eicholtz. Michael Murray succeeds Mr. Cowan.

C. W. Galloway, general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio, has been appointed general manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., succeeding A. W. Thompson as general manager, promoted. W. C. Loree, general manager of the Cincinnati, Hamilton & Dayton, with headquarters at Cincinnati, has had his authority extended over the Baltimore & Ohio Southwestern, with office at Cincinnati.

P. G. Cromar, whose appointment as assistant superintendent of the Canadian Pacific, with office at Schreiber, Ont., has been announced in these columns, was born on November 4, 1878, near Chesley, and was educated in the common schools. He began railway work on November 5, 1889, as an office boy on the Canadian Pacific, and from 1891 to 1908 he was consecutively railway operator, agent and yardmaster. He was then for three years general yardmaster at North Bay, and in 1911 was promoted to assistant superintendent of the same company with headquarters at North Bay, which position he held at the time of his recent appointment as assistant superintendent at Schreiber.

E. C. Blanchard, general superintendent of the Eastern district of the Northern Pacific at St. Paul, Minn., has been appointed general manager of the lines west of Paradise, Mont., with office at Tacoma, Wash., succeeding H. C. Nutt, fourth vice-president and general manager, resigned to go to the San Pedro, Los Angeles & Salt Lake. C. L. Nichols, general superintendent of the Central district at Livingston, Mont., succeeds Mr. Blanchard, and J. M. Rapelje, superintendent of the Idaho division at Spokane, Wash., succeeds Mr. Nichols. A. M. Burt, superintendent at Missoula, Mont., succeeds Mr. Rapelje, and F. L. Birdsall, superintendent of the Dakota division at Jamestown, N. D., succeeds Mr. Burt as superintendent of the Rocky Mountain division. W. H. Strachan, assistant superintendent of the Lake Superior division at Duluth, has been promoted to superintendent of the Dakota division, with office at Jamestown, succeeding Mr. Birdsall.

Merritt L. Phelps, whose appointment as superintendent of the Colorado Midland, with office at Colorado City, Colo., has been announced in these columns, was born September 14, 1861, at Lottsville, Pa., and received a public school education. He began railway work August 10, 1879, as a news agent on the Hannibal & St. Joseph, now a part of the Chicago, Burlington & Quincy, and a year later became a brakeman on the same road. For five years from 1884 he was with the Burlington at Lincoln, Neb., first as brakeman and then as conductor. He then went with the Kansas City, Fort Scott & Memphis, now the St. Louis & San Francisco, as conductor between Thayer, Mo., and Memphis, Tenn., and in 1890, resigned to go to the Colorado Midland as a conductor. On December 15, 1904, he was promoted to assistant superintendent of the latter road, which position he held until his present appointment as superintendent in charge of the entire line.

C. W. Galloway, who has been appointed general manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., was born on December 11, 1868, and entered the service of the Baltimore & Ohio in April, 1883, as a messenger boy in the operating department in Baltimore, and since that time has been in the continuous service of that company. He studied telegraphy and stenography, and from a clerkship was appointed private secretary to the late Thomas Fitzgerald in April, 1891. He remained in that position until September, 1897, when he was made trainmaster of the Baltimore division, becoming assistant superintendent at Cumberland, Md., in April, 1898. He was appointed superintendent of the Cumberland division in July, 1899, and in November, 1901, he was transferred to Baltimore in a similar capacity. Mr. Galloway was appointed superintendent of transportation of the entire Baltimore & Ohio system on December 20, 1906, and was advanced to general superintendent of transportation July 1, 1910, and in September of the same year he was made general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio, which position he held at the time of his recent appointment as general manager of the Baltimore & Ohio, with office at Baltimore.

C. W. Galloway.

W. J. Fripp, whose appointment as assistant general manager of the New York Central & Hudson River, with office at Albany, N. Y., has been announced in these columns, was born on August 25, 1863, at Albany, and graduated from the high schools of his native town in 1880. In July of the same year he entered the service of the New York Central & Hudson River at West Albany as a yard clerk, and eight years later was transferred as clerk to the office of C. M. Bassett, superintendent of the Mohawk division. In 1892 he was promoted to general despatcher in the freight yard at West Albany, and the following year was made freight trainmaster, becoming passenger trainmaster in 1898 on the Mohawk division, and in 1902 he was made assistant division superintendent. In 1906 he was division superintendent of the West Shore Railroad, at Weehawken, N. J., and was subsequently assistant general superintendent, and then general superintendent of the Boston & Albany, at Boston, Mass. He returned to Albany in 1910 as general superintendent of the Eastern district of the New York Central & Hudson River, which position he held at the time of his recent appointment as assistant general manager of the same company.

James T. Slattery, who has been appointed superintendent of the Denver & Rio Grande, with office at Helper, Utah, as has been announced in these columns, was born July 15, 1868, at Des Moines, Iowa. He was educated in the Nebraska public schools and also for a time attended the Central Business College at Denver, Colo., and he began railway work in 1886 with the Chicago & North Western in the construction department. In 1889 he went with the Denver & Rio Grande, where he was in the freight department for two years, and then went with the Chicago, Burlington & Quincy at Denver in the same department. He returned to the Denver & Rio Grande in October, 1893, and has been with that road ever since, having been consecutively locomotive fireman, traveling fireman, locomotive engineer and general air brake instructor. About six months ago he was promoted to trainmaster at Tucker, Utah, from which position he was recently advanced to superintendent of the Green River division, with office at Helper.

J. T. Slattery.

Traffic Officers.

Ralph W. Cooke has been appointed industrial agent of the Pennsylvania Company, with office in Pittsburgh, Pa.

W. S. Chadwick has been appointed traveling passenger agent of the Great Northern, with headquarters at St. Paul, Minn.

Lawrence L. Lawler has been appointed traveling agent of the Chicago, St. Paul, Minneapolis & Omaha, with office at Winnipeg, Man.

J. M. Maver has been appointed contracting agent of the Northern Pacific, with office at Montreal, Que., succeeding Tracey Howard, promoted.

Charles R. Bradley has been appointed freight agent of the Lehigh Valley, with office at Geneva, N. Y., succeeding Ray Wixon, transferred.

H. F. Blackmore has been appointed dairy agent of the Erie Railroad, with office at Chicago, succeeding F. T. Magan, resigned to accept service with another company.

M. S. Bowman, traveling passenger agent of the Chicago, Milwaukee & St. Paul at Philadelphia, Pa., has been appointed commercial agent, with office at Atlanta, Ga., a new position.

W. E. Duperow, city passenger and ticket agent of the Grand Trunk and the Grand Trunk Pacific, at Vancouver, B. C., has been appointed general agent, passenger department, with office at Vancouver.

F. H. Webber, contracting freight agent of the Illinois Central at Atlanta, Ga., has been appointed traveling freight agent, with office at Atlanta, succeeding A. O. Coke, transferred. As has been announced in these columns, C. R. Prince succeeds Mr. Webber.

Engineering and Rolling Stock Officers.

W. Gillespie has been appointed master car builder of the Central Vermont, with office at St. Albans, Vt.

J. A. Heaman has been appointed division engineer of the Grand Trunk Pacific, with office at Fitzhugh, Alta., succeeding J. Callaghan, resigned to become division engineer of the Pacific Great Eastern, which will build a new line for the Grand Trunk Pacific in Canada.

M. Clark has been appointed roadmaster of the Southern division of the Gulf, Colorado & Santa Fe, with headquarters at Brownwood, Tex. Charles Sullivan has been appointed roadmaster of the Beaumont division, with office at Silsbee, Tex., succeeding R. W. Grooch.

T. McHattie, whose resignation as superintendent of motive power and car department of the Central Vermont, was recently announced in these columns, has been appointed master mechanic of the Eastern division of the Grand Trunk, with office at Montreal, Que., succeeding J. Duguid, assigned to other duties.

The officers of division roadmaster of the Colorado Midland at Colorado City, Colo., and Cardiff, Colo., having been abolished, T. Kennedy, until last July division roadmaster at the former place, has been appointed general roadmaster, with jurisdiction over the entire line. D. Quinn, roadmaster of the First district at Colorado City, has been appointed assistant roadmaster.

V. C. Randolph, whose appointment as master mechanic of the Erie, with office at Avon, N. Y., has been announced in these columns, was born on October 19, 1869, at Randolph, N. Y., and was educated in the common schools at Salamanca. He began railway work in March, 1882, as a machinist apprentice on the New York, Lake Erie & Western, now the Erie, and after completing his apprenticeship he worked as a machinist until July, 1886, when he went to the Allegheny division as locomotive fireman, and was made engineman in April, 1891. He remained in that position until July, 1902, and then became locomotive and air-brake instructor at the International Correspondence Schools, of Scranton, Pa. In November, 1904, he returned to the service of the Erie as general air-brake instructor, and was promoted in January, 1910, to supervisor of locomotive operation of the Allegheny and Bradford divisions, which position he held at the time of his recent appointment as master mechanic of the Rochester division of the same road.

V. C. Randolph.

Louis J. Putnam, whose appointment as division engineer of the Chicago & North Western, with office at Boone, Iowa, has been announced in these columns, was born February 17, 1878, at Manchester, Iowa. He was educated at Cornell College, Mount Vernon, Iowa, receiving the degree of B. S. in civil engineering in 1903, and of C. E. two years later. He began railway work in June, 1898, with the Illinois Central; and in June of the following year went with the Chicago & North Western as an instrument man, and he has been with that road ever since. From February, 1901, to March, 1906, he was assistant engineer on construction, location and maintenance, and was then made acting division engineer of the Ashland division at Kaukauna, Wis. From March, 1907, he was consecutively assistant engineer in charge of second track and terminal improvements at Janesville, Wis.; as-

L. J. Putnam.

sistant engineer in charge of the bascule bridge over the north branch of the Chicago river and of the Wells street yard at Chicgo; resident engineer of the Milwaukee track elevation; resident engineer of the Escanaba ore dock construction; and from July, 1910, to April 1, 1912, he was with the Milwaukee, Sparta & North Western, the new line of the Chicago & North Western across Wisconsin, first as resident engineer on construction, and then as acting resident engineer. On April 1 he was promoted to division engineer at Boone.

OBITUARY.

Peter Charles Stohr, assistant director of traffic of the Southern Pacific, the Union Pacific, and the Oregon-Washington Railroad & Navigation Company, with headquarters at Chicago, was taken sick last week while on the road during a trip to the South, and died on April 24. Mr. Stohr was born on September 27, 1859, at New York, and was educated in the common schools. He began railway work in 1878 as an office boy on the Chicago, Rock Island & Pacific. In 1882 he was made a contracting agent of the Chicago & North Western, and from 1887 to 1889 was general eastern agent of the Minnesota & Northwestern. In 1889 he went to Chicago, where he was general freight agent of the Chicago, St. Paul & Kansas City, and continued in that position with the successor company, the Chicago Great Western. From November, 1898, to January, 1905, he was general traffic manager of the same road. In January, 1905, he was appointed assistant traffic director of the Union Pacific and the Southern Pacific systems, and his title was changed to assistant director of traffic on January 1, 1911.

P. C. Stohr.

John Borland Thayer, second vice-president of the Pennsylvania Railroad, who was at first reported saved from the Titanic when she sunk last week, has now been given up for lost. Mr. Thayer was born on April 21, 1862, at Philadelphia, Pa. After leaving the University of Pennsylvania in 1881, he entered the service of the Pennsylvania Railroad as a clerk in the Empire Line office, remaining in that position for about eighteen months, when he was transferred to the general freight department. After holding various position, he was in 1888, appointed freight solicitor of the United Railroads of New Jersey division. From February, 1889, to May, 1892, he was out of railway work. He returned to the service of the Pennsylvania Railroad in May, 1892, as division freight agent of the Northern Central, with headquarters at Baltimore, Md. On December 1, 1894, he was promoted to assistant general freight agent, with office at Philadelphia, Pa., and in March, 1897, was made general freight agent in charge of through traffic. In May, 1899, he was appointed general freight agent also of the Northern Central, the Philadelphia, Wilmington & Baltimore, and the West Jersey & Seashore. Mr. Thayer was elected fifth vice-president, in charge of traffic of the Pennsylvania Railroad on June 1, 1903. In October, 1905, he became fourth vice-president; in March, 1909, third vice-president; and in March, 1911, second vice-president of the company. Mr. Thayer was a director of the Pennsylvania Railroad and its more important controlled lines east of Pittsburgh, including the Long Island and the New York Connecting; he was director and president of the Erie & Western Transportation Company, and was a director of the Norfolk & Western and the Lehigh & Hudson River. He was a member of a large number of clubs and organizations, including the Philadelphia Club, the Union League and the Union Club of New York, the Metropolitan Club of Washington, D. C., the Railroad Club of New York, and the Chamber of Commerce of the state of New York.

J. B. Thayer.

A minute adopted by the board of directors of the Pennsylvania Railroad says in part: "In recording the terrible fate of a valued officer, and beloved and respected associate, we desire to pay fitting tribute to his memory and bear testimony to his great worth to the company, not only as an officer, but in its highest councils. Mr. Thayer was thoroughly equipped for the high office which he held, by his long service in the traffic department of the company, having discharged the duties of various official positions with the same diligence, intelligence and skill which were manifested and more highly developed in his executive life, until, through the channels of work well done and achievements of lasting importance, his name finds place on the roll of honor of those who have served the company faithfully and well: while to those who labored side by side with him his memory, though darkened by the tragic ending of his life at the high tide of his usefulness, is made more dear by the characteristic manhood and heroism with which he accepted his fate. His true value to the company did not consist alone in his ability as an executive officer and prominent standing as a traffic authority; his alert mind and power of ready expression made for much in argument, debate and negotiation, and never were the interests of the company safer than in his hands. A man in all that endears men to men, of genial nature, with an affable manner and a ready appreciation of humor, he was a charming companion and beloved by all who knew him, while the example of his integrity, honorable dealing and clean life is an inspiration alike to friends, associates and subordinates."

John H. McAdoo, general agent in the freight department of the Chicago & Alton, with office at Pittsburgh, Pa., died at Pittsburgh on April 16.

The Scottish railways have fully participated in the advantages arising from the activity of trade, and at the same time they have dealt with their increased traffic in an economical manner, their profits show great expansion. The directors, have, however been conservative in the matter of dividends in consequence of the loss of earnings from the existing coal strike, and of the expected increase in expenses in the current year from the advances in wages and from a higher price of coal. The conservatism in the matter of dividends is to be commended, especially as it makes for good results in future years. British railways, generally speaking, have in recent years suffered from the consequence of having divided their profits too closely for so many years, and having devoted insufficient sums to reserve, to depreciation and to provision for obsolescence. The Scottish railways in particular have suffered from the lack of conservatism in the matter of dividends in the past. When the waste arising from the use of small coal cars was demonstrated they found themselves with an immense amount of antiquated rolling stock which they were unable to scrap in consequence of the smallness of the funds they had set aside for depreciation and obsolescence. The more conservative dividend policy pursued in recent years has helped them materially to modernize their rolling stock without burdening the capital account, and the considerable amount of profits devoted in the past year to reserves and to other purposes will materially assist them in effecting greater economies of operation in the coming years as an offset to the advance in the rate of wages.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Kansas City Southern is in the market for 25 consolidation locomotives.

The Chicago, Terre Haute & Southeastern is in the market for five consolidation locomotives.

Wade, Clower & Wade have ordered one mogul locomotive from the Baldwin Locomotive Works.

The Pere Marquette is said to be in the market for 40 locomotives. This item has not been confirmed.

The Harriman Lines have ordered 20 Pacific type locomotives from the American Locomotive Company.

The J. A. Bel Lumber Company, Ltd., has ordered one six-coupled locomotive from the Baldwin Locomotive Works.

The Baskett Lumber & Manufacturing Company has ordered one mogul locomotive from the Baldwin Locomotive Works.

The New Orleans, Mobile & Chicago has ordered eight mikado locomotives and four Pacific type locomotives from the Baldwin Locomotive Works.

The Monongahela has ordered six consolidation locomotives from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 30 in.; the diameter of the driving wheels will be 51 in., and the total weight in working order will be 192,000 lbs.

The Northern Pacific has ordered two 10-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 20 in. x 28 in.; the diameter of the driving wheels will be 63 in., and the total weight in working order will be 169,000 lbs.

The Canadian Pacific has ordered 25 consolidation locomotives from the American Locomotive Company. The dimensions of the cylinders will be 23½ x 32 in.; the diameter of the driving wheels will be 63 in., and the total weight in working order will be 222,000 lbs.

The Vulcan Iron Works, Wilkesbarre, Pa., has received the following orders: Three contractor's locomotives for Richard Evans, Minneapolis, Minn.; four contractor's locomotives for the Purcell Construction Company, Tamaqua, Pa.; two contractor's locomotives for Timothy Burke, Scranton, Pa., and two contractor's locomotives for Dutton & Timson, Secreton, Sask.

CAR BUILDING.

The Wisconsin Fish Commission has ordered one special car from the Pullman Company.

The Lehigh Valley has ordered 250 refrigerator cars from the Standard Steel Car Company.

The Kanawha & Michigan has ordered 1,000 general service cars from the Ralston Steel Car Company.

The Lake Superior & Ishpeming has ordered 50 flat cars from the Western Steel Car & Foundry Company.

The Chicago, Indianapolis & Louisville is said to be in the market for 1,000 box cars. This item has not been confirmed.

The Kansas City Southern is in the market for 1,500 box cars, 1,000 all-steel gondolas, 400 flat cars and 100 automobile cars.

The New England Coal and Coke Company, Boston, Mass., has ordered 500 fifty-ton coke cars from the Cambria Steel Company.

The Intercolonial has ordered 400 box cars from the Nova Scotia Car Company, two dining cars and two sleeping cars from the Canadian Car & Foundry Company, and six first class coaches from the Preston Car Company.

The Harriman Lines have ordered 35 coaches, 15 60-ft. chair cars, ten 60-ft. mail cars, two 69-ft. combination mail and baggage cars, 39 60-ft. baggage cars, 14 dining cars, nine dynamo cafe and baggage cars, and two cafe observation cars from the Pullman Company.

The Atchison, Topeka & Santa Fe has ordered 1,000 box cars from the Standard Steel Car Company, 500 box cars and 25 copper ore cars from the Pullman Company, 1,000 box cars and 250 automobile cars, 500 automobile-furniture cars and 200 tank cars from the American Car & Foundry Company, 500 box cars and 100 flat cars from the Western Steel Car Company, and 50 air-dump cars from the Western Wheeled Scraper Company.

IRON AND STEEL.

The Pere Marquette is soon expected to be in the market for 4,000 tons of 90-lb. rails.

The Mexican Central has ordered 4,000 tons of rails from the Maryland Steel Company.

The Long Island has ordered 6,000 tons of rails from the United States Steel Corporation.

The St. Louis & San Francisco is soon expected to be in the market for 25,000 tons of rails.

The Chicago & North Western has ordered 5,500 tons of bridge material from the King Bridge Company and 1,600 tons from the American Bridge Company.

General Conditions in Steel.—The increase in prices has stimulated specifications on the existing contracts and the mills are forced to operate at almost full capacity to make prompt deliveries. Orders for new business are still small on account of the high prices. It is believed, however, that the manufacturers will still further increase the prices before the end of May. Steel company earnings are not expected to show much improvement in the second quarter over the first quarter, due to the small volume of new business.

Rail Production in 1911.

Statistics prepared by the American Iron and Steel Association show that the total rail production of all kinds in the United States in 1911 was 2,822,790 tons as compared with 3,636,031 tons in 1910, a decrease of 813,241 tons, or over 22 per cent. Of this amount 1,138,633 tons were Bessemer rails, 1,676,923 tons were open-hearth rails, and 7,234 tons were miscellaneous rails. Miscellaneous rails include 234 tons of iron rails, 462 tons of rails rolled from electric steel, and 6,538 tons of re-rolled steel rails which the makers were unable to classify as Besesmer or open-hearth. Of the total production, 2,708,795 tons were rolled from ingots made by the makers, and 113,761 tons were rolled from purchased ingots or blooms, crop ends, seconds, or renewed or re-rolled rails. The following table shows the production of Bessemer and open-hearth rails in this country from 1908 to 1911, inclusive.

	1908.	1909.	1910.	1911.
Bessemer	1,349,153	1,767,171	1,884,442	1,138,633
Open-hearth	571,791	1,256,674	1,751,359	1,676,923

The rail production according to weight for the last ten years is given as follows:

Kind of rails. Gross tons.	Under 45 lbs.	45 lbs. and less. than 85.	85 lbs. and over.	Total Gross tons.
Bessemer rails	111,231	606,300	421,102	1,138,633
Open-hearth rails	100,755	461,387	1,114,781	1,676,923
Miscellaneous	6,772	9	453	7,234
Total, 1911	218,758	1,067,696	1,536,336	2,822,790
Total, 1910	260,709	1,275,359	2,099,983	3,636,031
Total, 1909	255,726	1,024,856	1,743,263	3,023,845
Total, 1908	183,869	687,632	1,049,514	1,921,015
Total, 1907	295,838	1,569,985	1,767,831	3,633,654
Total, 1906	284,612	1,749,650	1,943,625	3,977,887
Total, 1905	228,252	1,601,624	1,546,053	3,375,929
Total, 1904	291,883	1,320,677	672,151	2,284,711
Total, 1903	221,262	1,603,088	1,168,127	2,292,477
Total, 1902	261,887	2,040,884	645,162	2,947,933

Supply Trade News.

The Curtain Supply Company, Chicago, announces the appointment of Fred M. Egolf as a new western representative, with office in Chicago.

L. R. Pomeroy, consulting engineer, has moved his office from 30 Church street, New York, to 105 West Fortieth street, New York.

The Isthmian Canal Commission will receive bids until April 29 on miscellaneous supplies, including car couplers. (Circular No. 704.)

The Railway Materials Company, Chicago, will move its general office on May 1 from the Old Colony building to the Railway Exchange.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., has moved its New York office from 1 Wall street to the Grand Central Terminal.

The Helmbacher Forge & Rolling Mills Company, St. Louis, Mo., has filed a petition in court at St. Louis, Mo., asking permission for dissolution.

The Niles-Bement-Pond Company, New York, will on May 1 move its Chicago office from the Commercial National Bank building to the McCormick building.

John P. Congdon, formerly supervising engineer for the Oregon Short Line, has opened offices in the Empire building, Boise, Idaho, as consulting engineer.

Herbert Wolff, mechanical engineer of the American Car & Foundry Company, New York, has been made assistant to Vice-President J. M. Buick, with office in St. Louis, Mo.

Paul M. Warburg, of Kuhn, Loeb & Company, New York, has been elected a director of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., succeeding Charles A. Moore, resigned.

The American Sheet & Tin Plate Company, Pittsburgh, Pa., having completed a series of service tests extending over several years, is now making all roofing terne plates exclusively from copper bearing open hearth steel.

The stockholders of the Bethlehem Steel Company, South Bethlehem, Pa., will vote on the question of authorizing an issue of $50,000,000 5 per cent. general mortgage bonds. Arrangements have been made to sell $15,000,000 of the proposed issue to retire maturing notes and bonds.

W. W. Gaffin, who has resigned after several years' service as division engineer of the Chicago & North Western at Fond du Lac, Wis., has formed a partnership with F. Gehri, of Janesville, Wis., and will conduct a contracting business under the name of Gaffin & Gehri at Fond du Lac.

Benjamin Guggenheim, president and director of the International Steam Pump Company, the Blake & Knowles Steam Pump Works; Henry R. Worthington, the Laidlaw-Dunn-Gordon Company, and the Power & Mining Machinery Company, all of New York, was lost at sea in the wreck of the White Star steamship Titanic, April 15.

John B. Given, general sales manager of the American General Engineering Company, New York, has been made sales manager for the New York and New England territory of the Continental Fibre Company, Newark, Del., and will handle the sales of track insulation to both steam and electric railways. The Continental Fibre Company will soon put on the market a waterproof track fiber.

The Joliet Railway Supply Company, Joliet, Ill., announces that in addition to the Perry anti-friction side bearings it has made arrangements for the exclusive manufacture and sale of the improved Hartman anti-friction center plate. In addition to its works at Joliet, the company is now equipping and will operate a large plant at Fortieth street and Princeton avenue, Chicago, to which point it will remove its general office from Joliet and its Chicago office from the Fisher building, maintaining sales offices only at the Karpen building, Chicago, Mutual building, Richmond, Va., and Syndicate Trust building, St. Louis, Mo.

Arthur M. Kittredge has resigned as president of the Barney & Smith Car Company, Dayton, Ohio. Probably no successor will be elected until the annual meeting in June. Mr. Kittredge entered the service of the Barney & Smith Car Company in 1884 as salesman, and was appointed assistant superintendent in 1886. He was superintendent from 1888 to 1900, when he was elected vice-president. This office he held until November, 1908, when he was chosen president to succeed Col. J. D. Platt. Mr. Kittredge is widely known among railway officials and manufacturers of railway equipment and is considered an authority upon matters of car construction. He remains a member of the board of directors of the Barney & Smith company, being also a director of many industrial and financial institutions. Since the organization of the Railway Business Association Mr. Kittredge has been very actively identified with its work and is now one of the vice-presidents of this association.

A new company is being formed, name not yet decided on. This company will have $15,000,000 capital stock, consisting of $5,000,000 7 per cent. preferred stock and $10,000,000 common stock. This company is a merger of the United States Electric Company, New York, the National Telephone Selector Company, New York, the Sandwich Electric Company, Sandwich, Ill., the Electric Switch & Signal Company, the Charter Electric Company, the Sandwich Pole Changer Company, Sandwich, Ill., and the International Telephone Call Company. The company acquires 150 patents and 1,600 allowed claims in the United States and in 20 foreign countries. The purpose of the company is to make and install, among other things, complete systems of automatic safety equipment. Among the directors of the company are Newman Erb, chairman of the Pere Marquette; Jules S. Bache, of J. S. Bache & Co., New York; James Gayley, formerly vice-president of the United States Steel Corporation; John W. Griggs, formerly attorney general of the United States; C. M. Seeley and C. N. Sigison.

TRADE PUBLICATIONS.

Motor Cars.—Burton W. Mudge & Company, Chicago, have issued a folder giving illustrations and specifications of its Mudge-Adams, Class E, 4 h. p., inspection track car.

Denver & Rio Grande.—This company has published an especially full and attractively illustrated pamphlet on The Fertile Lands of Colorado, written by Clarence A. Lyman of Loma. Colo.

Hydraulic Benders.—The Watson-Stillman Company, New York, has published catalog No. 83 on hydraulic benders. The catalog illustrates and describes the various types of benders and includes price and dimension tables.

Car Ventilation.—The Railway Utility Company, Chicago, has issued a small folder describing the Utility car ventilator, which is operated by a jet action caused by a downward rush of air between the body of the ventilator and an outer ring which siphons air from the interior of the car through an inner ring.

Structural Iron and Steel Work.—The Des Moines Bridge & Iron Company, Pittsburgh, Pa., has published a 50-page well illustrated catalog on its bridges, water towers, steel barges, turn tables, etc. Illustrations of many installations are shown; brief descriptions are given and a list of water towers and stand pipes installed by this company in the United States and other countries is included.

Small Polyphase Motors.—The General Electric Company, Schenectady, N. Y., has issued bulletin No. 4933, describing its small polyphase motors of riveted frame construction. These motors are for two and three-phase circuits and wound for 25, 40 and 60 cycles. They range from ¼ to 15 h. p. This bulletin describes both horizontal and vertical motors, and contains illustrations of various applications of the motors.

Dredging Buckets.—The Hayward Company, New York, has issued an attractive new illustrated catalog No. 39, devoted to a description of its orange peel buckets, clam shell buckets, drag scraper buckets, scraper clam shell buckets, excavators, counterweight drums, derrick fixtures, traveling derricks, coal handling machinery, dredges, etc. The catalog includes excellent photographs of the principal types of buckets in service and of their principal parts, and also contains complete price lists for the different sizes and capacities.

Railway Construction.

New Incorporations, Surveys, Etc.

Boston & Albany.—According to press reports, this company will spend over $1,000,000 for construction work this coming summer. The improvements include the laying of third track near Ashland, Mass., and extending the sidings at various points. The yard facilities at Worcester are to be remodeled, and several branch lines have been planned. New stations are to be put up at West Sprinfield, at Pittsfield, and at Worcester, and the platforms are to be lengthened on the stations between Boston and South Framingham and at West Springfield. A large number of bridges are to be rebuilt or repaired. F. B. Freeman, chief engineer, Boston, Mass.

Burrard Inlet Tunnel & Bridge Company.—An officer writes that this company expects to let contracts in about two months to build a line in connection with the Second Narrows bridge from Eburne in South Vancouver, B. C., northeast to Deepclove. There will be four steel bridges, to be from 2,000 ft. to 3,000 ft. long. D. Cameron, chairman, Winch building, Vancouver, B. C.

Canadian Northern.—An officer of the Canadian Northern Montreal Tunnel & Terminal Company writes that surveyors are now in the field and are preparing plans to drive a double track tunnel through Mount Royal, over three miles long, to provide an entrance for the Canadian Northern from the west into the center of Montreal, Que. A terminal station will be located in the center of the town between Cathcart and Lagauchetiere streets, and between Mansfield and St. Monique streets, and the tracks will be 40 or 50 ft. below the street surface. The track layout will consist of six or seven through tracks and half a dozen stub-end tracks, with platforms about 1,000 ft. long. The double track viaduct will continue down to the St. Lawrence river, where a connection will be made with the Harbor Commissioners' tracks, providing a through eastern connection with the Quebec lines of the Canadian Northern. There will also be an elevated freight yard with storage accommodations in the commercial district downtown. In connection with this project the company is developing a large town site on the Piedmont back of Mount Royal. The actual construction work will probably be started some time in May. The work is to be carried out by Mackenzie, Mann & Company. S. P. Brown, managing engineer, Montreal.

Canadian Northern Montreal Tunnel & Terminal Company.—See Canadian Northern.

Canadian Roads.—Premier Richard McBride of British Columbia is quoted as saying that a line is to be built from Vancouver to Fort George on the Fraser river and thence north and east along the Stuart river and lake. The main line will run east through the Peace river country from Stuart lake. A line will run north along Tremblem lake and the Nars valley to the Yukon. Uultimately this will be the main coast railway to Alaska. The bonds of this new line are guaranteed by the British Columbia government, and construction work has been begun. This new railway is expected to be completed from Vancouver to the MacKenzie valley and to the Yukon in four years. The line is being built by Foley, Welch & Stewart.

Central of Canada.—As soon as the plans of the route for this projected line from Carillon, Que., west to South Indian, Ont., about 50 miles have been approved by the Department of Railways & Canals construction work will be started. L. B. Howland, superintendent of construction, Toronto, Ont.

Central Pacific.—See an item under Railway Financial News.

Chicago, Burlington & Quincy.—All grading has been completed on the line from Thermopolis, Wyo., to Powder River, 103 miles, and track laying will be started this summer as soon as the bridge work is completed.

Chicago & Eastern Illinois.—The plans of this company call for improvements to be carried out during the coming year, at a cost of $2,000,000 as follows: Completion of the double tracking between Chicago and St. Louis, Mo., laying 15,000 tons of 100-lb. rails, putting up a new passenger station at Danville, Ill., and constructing new yards near West Frankfort, Ill., and at Cypress. L. C. Hartley, chief engineer, Chicago.

Chicago, Milwaukee & Puget Sound.—According to press reports work will be begun May 1 on the construction of a three-mile tunnel through the Cascade mountains. The work will cost nearly $5,000,000. The tunnel will shorten the line seven miles and will eliminate the heavy grade at the summit.

Chicago, Milwaukee & St. Paul.—This company has awarded the general contract for about 100 miles of second-track work on the Chicago & Council Bluffs division, between Marion and Coon Rapids, Ia., to McIntosh Brothers of Milwaukee, Wis. A general contract for 74 miles of second-track work on the Hastings & Dakota division between Aberdeen and Summit, S. D., has been let to Morris, Shepard & Dougherty of St. Paul.

Denver & Rio Grande.—An officer writes regarding the proposed double tracking improvements and betterment work on this line, that the company expects to begin work on extensive improvements in Utah at an early date. Contracts for the work have not yet been let. J. G. Gwyn, chief engineer, Denver.

Georgia Roads.—A company is being organized by capitalists of McRae, Ga., to build from Dublin, Ga., south to Douglas, about 75 miles. It is expected that contracts will be let about May 15. The company expects to develop a traffic in cotton, and lumber. M. T. McRae, president, McRae and W. J. Clark, engineer, Helena.

Louisville & Nashville.—According to press reports, the Louisville & Nashville has bought a strip of land in North Montgomery, Ala., 300 ft. x 4,500 ft., to be used for extending the yards. W. H. Courtenay, chief engineer, Louisville, Ky.

Maxton, Alma & Southbound.—An officer writes that this company expects to build a three-mile extension of the freight line now in operation from Alma, N. C., to Bracey, 12½ miles. A. J. McKinnon, president, Maxton, N. C.

Missouri & North Arkansas.—An officer writes regarding the reports that improvements are being carried out on this line, that extensions of the present line are not being considered; the work to be taken care of consists of bank widening, straightening the grades, and replacing the wooden bridges with concrete structures. E. M. Wise, general manager, Eureka Springs, Ark.

New York Subways.—The Board of Estimate and Apportionment, of New York, has approved the route of the Steinway subway extension from Fifth avenue to Eighth avenue, where a connection is to be made with the Seventh and Eighth avenue route. The board also approved the Seventh avenue extension from Twelfth street to Vesey street.

New Orleans, Mobile & Chicago.—An officer writes that the line from Laurel, Miss., north to New Albany, 214 miles, will be reconstructed, and 85-lb. rail is to be laid on this section. W. F. Owen, president and general manager, Mobile, Ala.

Norfolk & Western.—An officer writes that the Williamson & Pond Creek has been organized to bulid a 11-mile line from Williamson, W. Va., up Pond Creek valley, to connections with the coal operations in the Pond Creek district. Rights of way are now being secured. C. S. Churchill, chief engineer, Roanoke, Va.

North Lanark Railway.—See Ottawa & St. Lawrence (Electric).

Ottawa & St. Lawrence (Electric).—An officer writes that contracts are to be let to build from Ottawa, Ont., west via Arnprior to Braeside, thence south via White Lake, Lanark, Perth and Athens to a point on the St. Lawrence river eight miles west of Brockville, thence east to the boundary between the provinces of Ottawa and Quebec; from Ottawa south via Metcalfe, Vernon and Winchester to Morrisburg, connecting with the St. Lawrence river line, also to build a four-mile branch from Kenmore to Russell and a branch from the Arnprior-Lanark line to High Falls on the Matawaska river. The company has been authorized to take over the North Lanark Railway, and the two lines when completed will have a total length of about 274 miles. Work is expected to be started early in May, on the section from Ottawa south to Morrisburg, and soon afterwards work will be started from Ottawa west to

Arnprior. The assets and franchises of both companies have been taken over by J. A. Morden & Company, Toronto. J. E. Askwith, president, Ottawa.

Quebec Central.—An officer writes that the Quebec government has granted subsidies for the line from a point 30 miles from St. George, in Dorchester county, to a point in the parish of St. Sabine, county of Bellechase, about 1½ miles has already been constructed and is in operation. A further extension from St. Sabine to Dionne county, 50 miles, has not yet been definitely located. The general route will be through the counties of Bellechase, Montmagny and L'Islet, and there will be a terminal near St. Pamphile, in L'Islet county. Location surveys will probably be started this coming fall, and the construction work will be carried out next year. J. H. Walsh, general manager, Sherbrooke, Que.

Richmond & Rappahannock River (Electric).—An officer writes that this company was organized to buy a suburban electric line running north from Richmond, Va., and to extend it to the lower Rappahannock river or to Chesapeake bay; with branches and ferries in eastern Virginia, between the James and Potomac rivers. Surveys are now being made. C. L. Ruffin, vice-president, Richmond, Va.

San Antonio & Aransas Pass.—This company is said to have under consideration the question of building an extension from Lockhart, Tex., north to Austin, about 50 miles. L. Andrews, assistant engineer, Yoakum, Tex.

San Antonio, Uvalde & Gulf.—This road is now in operation from Uvalde, Tex., to Fowlerton, 121 miles, and work is under way from Fowlerton to San Antonio, and from San Antonio to the gulf. J. E. Franklin, president; A. R. Ponder, first vice-president and general manager, and M. E. Lemming, second vice-president and purchasing agent, all with office at San Antonio. (March 15, p. 526.)

Sandy River & Rangeley Lakes.—An officer writes that contracts have been let to Joseph Sacco, Portsmouth, N. H., to build a logging line from Sanders, Me., easterly to Mount Abram township, three miles. The work will be light, and involves handling about 5,000 cu. yds. a mile. The maximum grades will be 3 per cent., and maximum curvature 12 deg. T. L. Dunn, chief engineer, Portland, Me.

Southern Pacific.—This company has begun work on the project of changing its Jefferson street line out of Portland, Ore., to Oswego, Newberg and McMinnville, and the west side line to McMinnville from steam to electric power.

Sullivan County Electric.—Incorporated in New York with $200,000 capital, to build from Liberty, N. Y., west and southwest via White Sulphur Springs and Youngsville to Jeffersonville, about 15 miles. L. H. Brown, A. Brown and S. F. Crocker, New York, are the directors.

Tallahassee & Gulf.—An officer writes that this company's line is to connect Norfleet's Siding, Fla., with Jackson's Bluff, Oakgrove and Mekasel. Track has been laid on 12 miles. The plans call for building a 40-mile extension to Carrabelle. J. H. Norfleet, president, Ocklocknee, Fla.

Virginia Roads.—Plans are being made to build a line to connect Suffolk, Va., Chuckatuck and Smithfield, about 20 miles. It is expected that the work will be started in about 60 days. H. H. Prince, Norfolk, may be addressed.

Wabash.—According to press reports, contracts for grading embankments for new second-track have been let as follows: To W. E. Tench & Company, Detroit, Mich., between Oakwood, Mich., and Milan, 29 miles, involving the handling of about 100,000 cu. yds., the work to be finished by July 1; to Costello Brothers, Indianapolis, Ind., between New Haven, Ind., and Fort Wayne, five miles, the work to be finished by June 1, and to the Walsh Construction Company, Davenport, Ia., between Taylorville, Ill., and Litchfield, 33 miles, requiring the handling of about 200,000 cu. yds., the work to be finished by September. A. O. Cunningham, chief engineer, St. Louis, Mo. (April 12, p. 872).

Washington Roads.—Residents of Spokane, Wash., are said to be back of a project to build from Spokane southwest to a point on the Columbia river near Pasco, about 130 miles. C. B. Dennis is the principal promoter.

Williamson & Pond Creek.—See Norfolk & Western.

RAILWAY STRUCTURES.

Aurora, Neb.—The Chicago, Burlington & Quincy has let contracts for the construction of five fireproof brick stations to cost about $20,000 each at Aurora, Sheridan, Wyo., Seward, Neb., and Fairfield and Mt. Pleasant, Ia.

Chatham, Ont.—The Canadian Pacific will build new freight sheds this summer at Chatham, to cost between $30,000 and $40,000.

Danville, Ill.—The Chicago & Eastern Illinois will build a new passenger station.

Fairfield, Ia.—See Aurora, Neb.

Independence, Kan.—The Missouri Pacific will begin work soon on a new brick and tile passenger station, to cost about $34,000.

Montreal, Que.—See Canadian Northern under Railway Construction.

Mt. Pleasant, Ia.—See Aurora, Neb.

Newark, N. J.—Contracts were recently let by the Central Railroad of New Jersey to Henry Steers, New York, for the concrete piers for drawbridges over the Hackensack and the Passaic rivers. The same contractor is at work elevating the line between Jersey City, N. J., and Newark, on about 3½ miles. This includes the handling of about 1,600,000 cu. yds. The American Bridge Company has the contract for the steel work for the bridges. The improvements will cost about $2,000,000.

Oswego, Ore.—The Southern Pacific is preparing plans for large car shops at this point.

Pittsfield, Mass.—See Boston & Albany under Railway Construction.

Seward, Neb.—See Aurora, Neb.

Sheridan, Wyo.—See Aurora, Neb.

Tacoma, Wash.—It is reported that the Chicago, Milwaukee & Puget Sound will make improvements to double the capacity of the Tacoma car shops.

Terre Haute, Ind.—The Vandalia will spend about $100,000 on improvements to its terminals at this point.

Vancouver, B. C.—See Burrard Inlet Tunnel & Bridge Company under Railway Construction.

West Springfield, Mass.—See Boston & Albany under Railway Construction.

Worcester, Mass.—See Boston & Albany under Railway Construction.

A company has been incorporated in Havana, Cuba, with $100,000 capital for the construction of a railway four miles long from Havana to Cojimar. The building of this railway will necessitate constructing a tunnel under the bay to Casa Blanca.

The receipts of the Gibara Railway, Cuba, in 1911 from freight and passenger traffic were $132,431 and the expenditures $121,913, showing a net gain during the year of $10,517. This railway company was organized in 1883 with a capital stock of $400,000, and its assets now amount to $813,675.

The boards of directors of the Buenos Aires Southern and the Buenos Aires Southwestern railways, Argentina, have increased their capital to the extent of $25,000,000 for the purpose of investing the same in the construction of new branches and other railway improvements in the republic.

At the end of 1910 there were 3,806 miles of railways in Queensland, Australia, an increase of 264 miles over the previous year. At this time 431 miles of new line were under construction and 2,009 miles were authorized by the government but not yet begun. The gross earnings for the year were $12,456,705, and the expenditures $6,883,296, leaving net earnings of $5,573,409.

At the end of 1910 there were 375 miles of state-owned lines open to traffic in New South Wales. This compares with 3,623 miles at the close of 1909. The total gross earnings of these railways in 1910 were $28,554,622. Passenger receipts were $11,282,432, and freight receipts were $17,262,190. The cost of operation was $17,186,146, and the net earnings were $11,358,476.

Railway Financial News.

Central Pacific.—This company has acquired the lines and other properties of the following companies: Central California, Niles, Cal., to Redwood City, 16 miles; Fernley & Lassen, projected from Fernley, Nev., to Susanville, Cal., and beyond; Chico & Northern, Chico, Cal., to Stirling City, 32 miles; Modoc Northern, projected from Alturas, Cal., to Klamath Falls, Oregon; Sacramento Southern, Sacramento, Cal., to Walnut Grove, 24 miles, of which nine miles are operated; Goose Lake & Southern, projected from Goose Lake, Cal., to Anderson; Oregon Eastern, Weed, Cal., to Klamath Falls in operation, thence to Natron under construction. The Central Pacific assumes the bonds of these companies, which, together with the stocks, have been held by the Southern Pacific, subject to such disposition as may later be determined on to reimburse the Southern Pacific for advances made for construction. The bonds include $3,000,000 30-year bonds of the Central California; $1,000,000 30-year bonds of the Chico & Northern; $2,500,000 30-year bonds of the Sacramento Southern, and $5,000,000 30-year bonds of the Oregon Eastern. The bonds are all dated November 1, 1911, except the Oregon Eastern, which are dated January 2, 1912.

Chicago, Indianapolis & Louisville.—White, Weld & Company, and Potter, Choate & Prentice, both of New York, are offering at 110½ and interest, yielding over 4.40 per cent., the unsold portion of the $1,558,000 refunding mortgage 5 per cent. bonds, series B, dated July 1, 1897-1947. These bonds were sold by the company to provide for the purchase of additional equipment, and are the remainder of an authorized issue of $15,000,000, comprising $4,700,000 series A 6 per cent. bonds, $5,000,000 series B 5 per cent. bonds, and $5,300,000 series C 4 per cent. bonds.

Chicago, Terre Haute & Southeastern.—F. J. Lisman & Co., Chicago, are offering at 97 and interest a block of first and refunding mortgage 5 per cent. bonds, of December 1, 1910-1960. The amount outstanding is $3,950,000.

Cleveland, Cincinnati, Chicago & St. Louis.—Application has been made to the Ohio Public Service Commission by this company and by its controlled property, the Cincinnati Northern, to issue $1,579,000 and $144,000 bonds, respectively, to pay their floating debts and for improvements.

Denver & Rio Grande.—E. L. Brown, vice-president and general manager of the company, has been elected a director to succeed Howard Gould, resigned.

See item in General News Section.

Georgia & Florida.—The $2,000,000 general mortgage 6 per cent. bonds dated February 1, 1912-1932, which have been underwritten at 52 per cent., as was mentioned in the *Railway Age Gazette* of March 29, are being offered to stockholders to the extent of 22 per cent. of their holdings. The interest accruing on these bonds up to and including February 1, 1922, may be paid either in cash or in script obligations bearing 5 per cent. interest. These script obligations may be converted into 5 per cent. coupons when presented in multiples of $300. The 6 per cent. bonds and the 5 per cent. script obligations are callable at par and interest. An underwriting syndicate has agreed to take up all bonds which are not subscribed for by the stock holders on the same terms on which the bonds are offered to the stockholders for a commission of 1¼ per cent.

Grand Trunk.—The purchase of the River & Rail Coal Company, Belmont county, Ohio, has been effected. It is reported that the purchase was made by a syndicate identified with the Grand Trunk and the Canadian Pacific, and that the property will be operated under the old name but that its output will be mostly used by the Grand Trunk and the Canadian Pacific. An issue of £1,500,000 ($7,500,000) perpetual 4 per cent. consolidated debenture stock is being offered in London. This stock ranks on an equal basis with $17,971,942 stock already listed on the London Stock Exchange. The proceeds will be used for general purposes.

Houston & Brazos Valley.—The Texas Railroad Commission has authorized the registration of $220,000 bonds, secured by a mortgage on the entire line. The road runs from Anchor, Tex., to Velasco, 20 miles.

Kansas City, Mexico & Orient.—A proposal to issue $2,225,000 receiver's certificates was made by the receivers to Federal Judge Pollock at a hearing at Kansas City, Kan., on April 22. Decision was reserved until April 27. It is said that $1,000,000 is needed for the completion of the road from Granada, Kan., to Alpine, Tex., and that a part of the money would be used to pay the floating debt.

Lehigh & Hudson.—Articles have been filed with the secretary of state of New Jersey merging the Mine Hill Railroad, the South Easton & Phillipsburg of New Jersey and the South Easton & Phillipsburg with the Lehigh & Hudson, under the name of the Lehigh & Hudson River Railway. The Lehigh & Hudson under the merger has combined $1,700,000 capital.

Pere Marquette.—United States District Judge Angell on April 23 granted permission to the receivers to issue $605,000 receivers' certificates. It is understood that the money will be used to pay taxes due April 30 and to meet pay rolls.

Rutland.—E. H. Rollins & Sons, Boston, are offering the unsold portion of $500,000 4½ per cent. equipment trust certificates dated May 1, 1912, maturing annually from May 1, 1913 to May 1, 1927. The yield varies from 4.45 per cent. to 4.65 per cent. These certificates were issued to provide 90 per cent. of the cost of new equipment.

The minority stockholders' protective committee, composed of Tompkins C. Delavan, John F. Calder, Ralph L. Shainwald and George N. Towle, with Samuel Untemeyer, counsel, in a circular letter to the minority stockholders, advises them to hold their stock for the same price, namely, about $105 per share, to be paid by the New York, New Haven & Hartford for the majority stock. The committee goes on to say that at the opening of the suit the stock was selling at $28 per share, that $67 per share is now being offered, and that in its judgment it is worth intrinsically over par.

St. Louis Southwestern.—Stockholders on April 17 authorized a mortgage to secure an issue of $100,000,000 first terminal and unifying 5 per cent. bonds of January 1, 1912-1952, of which $7,500,000 have been sold as was previously announced.

Shamokin, Sunbury & Lewisburg.—The $1,000,000 first mortgage 5 per cent. bonds of this company, a subsidiary of the Reading Company, will be paid at maturity, May 1, at the office of Drexel & Co., Phladelphia, Pa. The bankers offer the holders of the bonds the opportunity to extend them at 4 per cent. until July 1, 1925, the extended bonds to be guaranteed principal and interest by the Reading Company. This road runs from Carbon Run Junction, Pa., to West Milton, 31 miles.

Southern Pacific.—See Central Pacific.

At the end of 1910 there were 2,058 miles of railways open to traffic in South Australia, and 303 miles authorized and under construction. Gross earnings were $8,944,339; expenditures $5,196,020, and net earnings $3,748,319.

The mountain observation cars of the Canadian Pacific have been taken as the pattern for the design of some cars which are now being built by the Austrian state railways for use on the summer tourists' lines, and a similar car is to be built for the Austrian minister of railways.

The construction of the railway from Gheringhap, Victoria, to Maroona is proceeding rapidly. Derrinallum and Cressy have already been connected and freight is being transported over 24 miles of the line, but no provision has yet been made for passengers. When the Derrinallum district has been opened up it is anticipated that the grain traffic and general freight business of the railways will develop enormously.

When the Australian Transcontinental Railway is completed there will be a through service between Perth and Adelaide. This line will not be expected to earn its expenses for some time, as there will be stretches of hundreds of miles which will scarcely give rise to any traffic at all. The reason for the construction of this line is largely political, for it will have a great effect in unifying Australia.